

Updated Draft Annotated Bibliography
Version 4

Prepared for

Global Network on Energy for Sustainable Development

“Energy Access” Theme

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1.0 INTRODUCTION

This updated draft annotated bibliography has been developed for the “Energy Access” Theme of the Global Network on Energy for Sustainable Development. It is a third attempt to collate literature on energy services for the poor. In addition, literature on energy sector reform (mainly in the electricity sub-sector) is provided within the context of its implications to the poor. The literature has largely been sourced from the AFREPREN/FWD Documentation Unit in Nairobi, Kenya as well as some documents downloaded from the Internet. This fourth version also incorporates additional literature from Latin America as well as contributions from Bariloche Foundation Colleagues.

The literature in this annotated bibliography is sub-divided into four geographical sections namely: Section 2.0 on Africa; Section 3.0, Asia and the Pacific; Section 4.0, Latin America, and; Section 5.0, Global.

The current draft provides additional material on the global coverage of the subject in addition to selected literature from Latin America and Asia/Pacific. However, there is still a deficiency of Latin America and Asia/Pacific literature. Future drafts of this Annotated Bibliography shall continue to rely on comments and suggestions from GNESD Energy Centres in Latin America and Asia, to fill these important gaps in geographical coverage.

2.0 AFRICA

Adeoti, O.; Oidowu, D.O.; Falegan, T

Could Fuelwood Use Contribute to Household Poverty in Nigeria? Biomass Bioenergy, Vol.21, No.3. Elsevier Science Limited, Oxford, 2001.

Abstract: To show whether fuelwood use could contribute to household poverty in Nigeria, the paper has used the discount cash flow micro-economic assessment to evaluate the annual worth cost of harnessing fuelwood for cooking and water heating in Nigerian household, for an average household size of five persons per day. Findings indicate that 9,786 Naira is being expended on cooking and water heating activities at the household level in Nigeria which is much greater than the mean national household income of about 5,150 Naira a year. The study has shown that households using fuelwood are made poorer and left with no savings.

Keywords: *energy; household; poor; Africa; Nigeria. 6 pages*

Afrane-Okese, Yaw; Zhou, Peter P.

Urban and Rural Energy in Botswana: Needs and Requirements. Ministry of Minerals, Energy and Water Affairs, Gaborone, Botswana, July 2001.

Abstract: This document is a synthesis report on two projects established under the tenders called for by the Government of the Republic of Botswana in 2000. There were two projects under the tender. The first called for a study to be conducted to determine the actual fuelwood consumption patterns in six selected urban areas in Botswana and the second was designed to collect information on rural energy needs and requirements in Botswana, covering eleven selected rural settlements. This report is a synthesis of the salient findings of both the urban and rural studies and details of the presentations made here can be found in these two sources.

Keywords: *Botswana; urban; rural. 40 pages.*

Anneck, J. W.

The Benefits of Electrification to Rural Households: Real or Potential? Journal of Energy in Southern Africa Vol.9, No.4 November 1998, Energy Research Institute, Cape Town.

Abstract: This paper assesses some of the results of the research done to date in EDRC's *The role of electricity in the integrated provision of energy in rural areas* (RE) project, and what benefits electrification may or may not have contributed to rural households. Since 1995 the RE project has run parallel to the accelerated electrification of rural areas and has evaluated various aspects of this implementation drive. The paper highlights the assumptions that are made about the benefits of electricity on rural households, tests the findings of the RE project against these assumptions, and advocates the continuation of the electrification programme, in conjunction with greater attention being given to the provision of other energy services.

Keywords: *rural electrification; household energy; South Africa; women. 5 pages*

Appropriate Technology International.
Senegal Stove Success Story. In: Boiling Point No. 35. Intermediate Technology Group Ltd, Rugby, 1995

Abstract: Appropriate Technology International is a sustainable enterprise working with small scale businessmen. Its activities in Senegal since 1990 have focused on developing and demonstrating methodologies for rethinking the production process for basic economic activities in which many small scale producers are involved. This paper focuses on the successful stove project experience in Senegal.

Keywords: *Senegal; efficiency; stove. 1 page.*

Bailey, Petern
Energy and Poverty: What, no more energy projects? Energy Management News, March 2001. Energy Research Institute, Cape Town.

Abstract: Multilateral and bi-lateral agencies have reaffirmed their mandates through the adoption of international development targets to halve global poverty by 2015. This has led to some parties questioning the role that energy projects play in poverty reduction. This is a fundamental question that needs answering: What role does energy play in the reduction of poverty?

Keywords: *energy; Africa; article; poor. 2 pages*

Bannister, Alison
Energy, Poverty and Sustainable Urban Livelihoods. Energy Management News March, 2001. Energy Research Institute, Cape Town, 2001.

Abstract: This is an article on energy, poverty and sustainable urban livelihoods. The urban poor suffer most from combustion-related pollution. They have to live in the most polluted areas of cities, often next to industrial plants. In the home, women and children are exposed to smoke from burning low-grade fuels for cooking and heating. Because fuel is largely commercially traded, it is the largest item of poor household expenditure after food.

Keywords: *energy; Africa; poor; urban. 1 page*

Chandi, Langiwe
Energy Initiatives for the Rural Poor: The Zambian Experience. Department of Energy, Ridgeway, Lusaka, 2002.

Abstract: This paper is extracted from the results of a three-year research programme conducted under the African Energy Policy Research Network (AFREPREN) with the sponsorship of Sida. The paper in general examines several factors that are deemed important to increase access to cleaner forms of energy for the rural poor and especially women because they are the custodians of energy for domestic use. In Zambia, the implication is that they are the custodians of wood fuel, which accounts for over 70 percent of the total national energy supply. This paper examines the suitability of the national policies and programmes in relation to improving access to cleaner forms of energy to the rural poor.

Keywords: *energy; Africa; Zambia; rural; poor; gender; policy. 15 pages*

Clark, A.

Improving the Energy Services to the Urban Poor of South Africa. Journal of Energy in Southern Africa Vol.9 No.2 May 1998, Energy Research Institute, Cape Town

Abstract: This paper introduces the research to the EDRC project on 'Energy efficiency, equity and environment: improving access to energy services for the urban poor of South - Africa'. It also provides the background to Randall Fecher's paper, on an economic analysis of energy efficiency for the urban poor undertaken by the EDRC.

Keywords: *energy efficiency; South Africa; urban areas; poverty; domestic energy. 2 pages*

Conteh, M. A.

Privatisation and Liberalisation of the South African Electricity Industry. In: Journal of Energy in Southern Africa, Vol.14 No.1, Energy and Development Research Centre, Cape Town, South Africa, 2003

Abstract: This paper discusses some of the issues of privatization and liberalizing the South African electricity industry. The government's stance on the privatization and liberalization of the industry is to attract foreign investment and provide its citizens the opportunity of choosing their suppliers. The global progress in the privatisation and liberalization is not really significant. This paper presents the argument in that it is not yet timely to privatize the industry because the government's developmental programs to alleviate poverty in rural areas, which will empower them to pay electricity prices that are cost-reflective when privatization takes effect, are yet far from completion. Again, the fluctuating Rand and the government's strict monetary control are large risk for foreign investment. The excess generating capacity of ESKOM also amplifies risk investment. In addition, there is a need for concern over the stranded cost of ESKOM's investments.

Keywords: *South Africa; rural; poverty; electricity. 6 pages*

Davidson, Ogunlade, Mwakasonda, Stanford

Energy Access Perspective in Africa: Draft Report for Global Network on Energy for Sustainable Development. Energy and Development Research Center, Cape Town, 2003

Abstract: Increasing access to affordable, adequate, and reliable modern energy services remains a major challenge to many developing nations of the world, especially those in South East Asia and Africa. This is important because energy is not only at the pivot of economic development of nations but also provision of energy services meets basic human needs such as water and sanitation, and cooking and the driver for productive activities of the poor and their social services. This short paper strictly restricts its discussion to two countries, South Africa and Zimbabwe, though some general comments on the continent and the SADC region are included. The paper comments on the energy services and technologies available to the poor as they face different situation depending on their national circumstances.

Keywords: *poverty; rural; South Africa; Zimbabwe; Africa. 28 pages*

Davis, Mark.

Rural Household Energy Consumption: The Effects of Access to Electricity – Evidence from South Africa. Energy Policy Volume 26 Number 3 February 1998, Elsevier Science Limited, West Sussex.

Abstract: This paper examines household energy consumption patterns in rural areas in the light of energy transition theories. In particular, the study aims to identify the effects of access to electricity on fuel choice. The analysis uses data from an extensive household survey conducted in South Africa and examines the prevalence of different fuels, energy expenditure, the end-uses of fuels, and multiple-fuel use patterns. It is concluded that evidence exists for the presence of an energy transition in rural households, largely driven by income. Access to electricity affects the nature of this transition, and there is weak evidence to suggest that it accelerates the process.

Keywords: *rural; household; transition. 11 pages*

Davis, M.; Ward, S.

Household Energy-use Patterns in Rural Areas: The Effects of Access to Electricity, Energy and Development Research Centre, Cape Town, South Africa, October, 1995.

Abstract: It is necessary to attempt to understand the way in which access to electricity affects and does not affect people's lives. This paper presents the results of a quantitative description of household energy use patterns in rural; areas of South Africa, based on an analysis of data from the Project for Statistics on Living Standards and Development survey.

Keywords: *electricity; Africa; rural; household. 21 pages*

Davis, M.; Ward, S.

Rural Electrification and the SMME Economy in South Africa. Energy and Development Research Centre, Cape Town, South Africa, August 1997.

Abstract: The task in this report is to contribute to policy debates and towards refinement of rural electrification programmes in South Africa. It aims to investigate the particular contribution of electrification to the development of the small, medium and micro enterprise economy in rural areas. The report covers assessment of the international experience of the impact of electrification programmes on rural small enterprise development and narrows to specific South Africa situations.

Keywords: *electricity; Africa; rural. 21 pages*

de Beer, Frik; Swanepoel, Hennie

Energy and the Community of the Poor: Urban Settlements, Household Needs and Participatory Development in South Africa. Energy Policy Volume 22 Number 2 February 1994, Butterworth-Heinemann Limited, Dorset.

Abstract: The main objective of this paper is to emphasize the need for community participation in decision making affecting their lives and development. Opinion leaders and executives (especially those of a corporate background) need to understand the socioeconomic milieu in which the majority of South Africans live. In the urban areas, where we put our focus, most of the poor people live in informal housing. This paper starts with a typology of types of settlement found in our cities. The circumstances in which the people live forms the second component of the paper. If the people are to be dealt with as a part of

the solution (and not as 'the problem') community participation should feature high on the agenda not only of government but also of parastatals and private companies. The paper is concluded with a discussion of the idea of community participation.

Keywords: *poverty; participation; settlement. 6 pages*

Deepchand, K.

Promoting Equity in Large-Scale Renewable Energy Development: The Case of Mauritius. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). Energy Policy. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: About 90% of the arable land in Mauritius is under sugarcane, with an annual production of 600,000 tonnes of sugar. Around 1.8 million tonnes of bagasse are available annually, principally for electricity generation in the sugar factories, and lately, for producing power for export to the national grid. Following the enactment of appropriate legislation by Government, and active involvement of the local private entrepreneurs, bagasse-generated electricity exports to the grid have become a major source of revenue. To ensure that all stakeholders in the sugar industry benefit from the sale of electricity to the grid, the Government established the Bagasse Transfer Price Fund and Sugar Investment Trust, which ensure that revenue from co-generation is equitably shared by all stakeholders. This paper presents the main features of the revenue-sharing mechanisms, which ensures that substantial benefits flow to all key stakeholders of the sugar company, including poor small holder sugar farmers.

Keywords: *Co-generation; Revenue sharing: Mauritius. 13 pages*

Drummond, Richard - Editor

Energy Management News, Vol. 7 No. 1. Energy Research Institute, University of Cape Town, SADC Industrial Energy Management Project, South Africa, 2001.

Abstract: The newsletter is titled, "SADC training programmes on rural energy planning and environmental management: Extension phase launched." The other articles are concerned with energy issues such as energy, poverty and sustainable urban livelihoods; the 3E strategy of how to save energy and money - which outlines energy saving opportunities for the various services such as motors and drives, compressed air, refrigeration and chilled cooling water; and workshops on energy options for rural communities.

Keywords: *energy; Africa; poor; urban. 34 pages*

Dube, Ikhupuleng

The Influence of Expenditure Patterns in Determining Access to Electricity by Zimbabwe's Urban Poor. AFREPREN, Nairobi, 2001.

Abstract: This paper analyses the influence of urban household incomes in determining access to electricity by the urban poor. This is achieved through a comparison of consumption expenditures and monthly energy costs of different urban households. It also analyses various policy options that may be adopted by stakeholders to enhance access to electricity by the urban poor.

Keywords: *Africa; Zimbabwe; urban; poor; electricity; household; policy. 27 pages*

Edjekumhene, Ishmael;; Amadu, Martin Bawa; Brew-Hammond, Abeeku
Preserving and Enhancing Public Benefits Under Power Sector Reform: The Case of Ghana. Energy for Sustainable Development Volume V No.2 June 2001, International Energy Initiative, Bangalore.

Abstract: The power sector in Ghana has been undergoing reforms whose main purposes are to improve the performance of companies in the industry, create an enabling environment that would attract private capital into the sector, and create a framework that would enable a competitive and unbundled industry structure to evolve. This paper explores whether and how public benefits have been catered for in the ongoing reform process in Ghana. The paper reveals that the reform process in the country has provided adequate safeguards against adverse socio and environmental consequences of reform. In addition, opportunities for advancing public benefits have been exploited. The paper concludes that the biggest problem for the regulators is how to raise tariffs to economic levels and still provide affordable power to poor urban and rural consumers. Even at prevailing tariffs, adjudged to be low and uneconomic, both industrial and residential consumers complain that they are too high. The paper, however, recommends that tariffs should of necessity go up, otherwise the objectives of the reform process cannot be achieved.

Keywords: *electricity; reform; policy; Ghana. 9 pages*

Ellegard, Anders; Nordstrom, Mattias.
Rural Energy Service Companies - Experiences from Zambia. Ministry of Energy and Water Development, Lusaka, 2001.

Abstract: This paper constitutes a working paper aiming at compiling project achievements so far, issues and obstacles encountered and lessons learned along the way. The original idea of the project was to support the formation of a local company that could supply energy services to rural people. The project was thought of as essentially providing training and credit to these companies, and the companies would from this point continue independent operation in the market place. The project has been successful in creating interest and awareness around solar PV technology and in the concept of making people pay for a service rather than for the ownership of certain pieces of equipment, in the Eastern Province of Zambia, in the country in general and internationally.

Keywords: *PV; Zambia; Africa; rural. 52 pages.*

ENDA
Energy Access for the Poor in West Africa. ENDA, Dakar, 2003

Abstract: As far as energy is concerned, countries in the West African sub-region, especially countries of West African Economic and Monetary Union (WAEMU), are characterized by severe energy deficiency or “energy poverty”, which results in a dual state of dependence. This dual dependence has a negative influence on the access of the local population to energy sources within the context of the fight against poverty, since the capacity to satisfy basic energy needs of local populations (food, health, water, education), requires the provision of different forms of energy. The scarcity or high costs of the latter, inevitably leads to the perpetuation of poverty, especially in the rural regions of Africa. Hence, access to energy has to be considered on equal terms with the other basic services, in order to improve the living standards of disadvantaged population groups, enhance economic growth and increase the incomes of the poor. This is all the more important, given that development of the other basic services, such as education, vocational training, health, entrepreneurship, etc., require various forms of high quality and cheap energy services,

which in turn demand the introduction of appropriate technology options. Recourse to multiple energy solutions depends on the consumers, who are mostly poor; and this emphasizes the need for technology options that respond to their basic capacities. For instance, it is useless to opt for PV, when a small electric generator would be appropriate. Hence, increasing the access of the poor to high quality energy services entails a revision of energy policies, on both the demand and supply levels, so as to formulate proposals that will be useful in enhancing the sustainable provision and supply of energy for the benefit of poor population groups. This demands a precise determination of the degree of access by poor population groups to appropriate technology and energy services. It also requires a survey of all the different projects involving energy policy reform and their impact on the issue of access to energy supplies.

Keywords: *poverty; population; rural; Africa. 10 pages*

Energy and Development Research Centre
Rural Electrification in South Africa. Energy & Development Research Centre,
University of Cape Town, Cape Town, 1998.

Abstract: This publication presents, in a concise, summarised form, the main research outputs of a comprehensive research project on 'The role of electricity in the integrated provision of energy to rural areas of South Africa', conducted over three years by the Energy and Development Research Centre at the University of Cape Town. The overall aim of the project has been to assist with the development of rural electrification policy that is consistent with South Africa's national and regional development goals.

Keywords: *South Africa; electricity; energy; planning. 48 pages.*

Ferrando, Lesley Janet
Electricity Basic Support Services Tariff (EBSST), National Electricity Regulator (NER),
2003

Abstract: President Thabo Mbeki announces in October 2000 that the indigent households of South Africa would receive a certain amount of electricity and water free. This decision was taken to address the needs of millions of South Africans who cannot afford to pay for basic services. The goal is to enable the indigent to break out of the poverty cycle and attain an improved quality life. The Department of Minerals (DME) was tasked with developing a national policy and implementation strategy with regard to the electricity portion of this initiative. A task team consisting of industry representatives was convened. Research was undertaken into these issues surrounding this initiative, which included a number of pilot studies. Based on this research, a national policy was approved by Cabinet and announced in December 2002, consisting of an allocation of 50 kWh per month to the very poorest households, which would possibly be expanded to include other customers at some later stage. The implementation policy is in the process of being finalized (DME 2003), and funding mechanisms determined. The national policy is scheduled to be rolled-out during the 2003/2004 financial year.

Keywords: *electricity; tariff; South Africa; poverty; household. regulatory. 4 pages*

Gitonga, S; Mureithi, J; Theuri, D

Gaining Ground in Community Micro-hydro Power Development in Kenya. In: Boiling Point No. 45. Intermediate Technology Group Ltd, Rugby, 2000.

Abstract: This article is a case study of work being developed by ITDG East Africa and the Ministry of Energy in Kenya, with financial support from UNDP GEF small Grants Programme. The project idea started with a meeting between the Ministry of Energy and ITDG staff in March 1997 as a result of the emerging potential of the micro-hydro centre in Kenya. The project demonstrated how small hydro can be used to provide modern energy services to low-income rural communities.

Keywords: *Energy; Kenya. 3 pages.*

Golding, A. P.

Energy Usage in Formal and Informal Black Townships. Journal of Energy in Southern Africa Vol.4 No.4 November 1993, Energy Research Institute, Cape Town.

Abstract: As part of a nation-wide data collection effort to determine the differing needs of urban energy users, 2,064 formal and informal households were interviewed about types of fuel used, appliances, consumption and expenditure, purchase and problems experienced. The survey was framed within the context of economic development and the socio-demographics of population growth, housing shortage and urbanization on the one hand, and the "energy transition process" on the other. Eleven settlements mainly in Natal and the Transvaal, representing a cross-section of communities, were classified onto four categories of formal and informal housing. Comparative results based on aggregated data suggested that geographical area and dwelling-type are major determinants of the mix of fuels used. Residential histories show that free-standing settlements are largely the result of overflow from the formal townships rather than the result of rural migration. Although there was some evidence to suggest people might obtain electricity the longer they were resident in an area, overall, the historic inequalities in service provision for blacks, the constraints on upward mobility, the shortage of formal housing and the lack of electricity in many areas means that the energy transition process is rendered somewhat obscure.

Keywords: *townships; fuel use; urbanization; energy transition; informal settlements; transitional fuels; traditional fuels; household energy. 7 pages*

Haanyika, Charles Moonga

Assessment of the Impact of Power Sector Reforms on the Technical and Financial Performance of Electricity Utilities and Expanded Electrification of the Poor in Zambia. AFREPREN, Nairobi, 2002.

Abstract: The current reforms in the power sector started over 20 years ago in America and have in the last 10 years spread throughout the developing world. The incentives for the reforms have been numerous varying from the need for Government to leave business to private sector; the demand for improved services and lower power tariffs through competition; requirements to attract private sector investment particularly in developing countries; and, the strong interconnections between neighbouring countries has lead to the need for reforms. Although technical and financial performance of power companies have not taken centre stage in the power reforms, performance is critical to both utility existence and to the success of the reforms. On one hand the investors would like to get a reasonable return on their investment while on the other hand, consumers want to get quality products and services. In addition, power companies are faced with other major challenges such as provision of electricity to unprofitable rural areas and to the urban poor. These challenges

can be a threat to the very existence of the power utility. Often Government is called upon to provide some cushion and take on the task of electrifying the urban and rural poor.

Keywords: *Africa; Zambia; electricity; reforms poor.*

Habtetsion, S.; Tsighe, Z.

The Energy Sector in Eritrea – Institutional and Policy Options for Improving Rural Energy Services. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). Energy Policy. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: The energy consumption patterns and in particular, those of the rural household and small and medium enterprises (SMEs) in Eritrea are assessed. Eritrea's total final energy consumption in 1998 was estimated to be around 619,580 toe, of which 68% was consumed by the household sector, 16% by the commercial/public sector, 13% by transport and 3% by industry. The sources of energy were 66.3% biomass based (fuelwood, dung, charcoal, agri-residue), 31% oil products and 2% electricity. It is also noted that 98% of the rural population and 20% of the urban residents do not have access to electricity. Over 80% of the energy needs of rural enterprises is met by biomass or animate/human labour. To analyze the root problems hindering the wider dissemination of modern energy services to rural areas, two key hypothesis related to policy and institutional framework were selected and tested. The findings indicate that Eritrea has general energy policies pertaining to the development of electricity, oil and renewable energy sub-sectors for the benefit of the public and the economy. The absence of sharply focussed, pro-rural energy policy and/ or their policy instruments has been observed. The key problem is, however, the weakness in implementation of rural energy projects and programmes. This is mainly due to inappropriate institutional structure and/or gaps in the structure, in addition to lack of corporate culture; poor incentives for workers; and poor linkages among the various stakeholders concerned in energy for rural development.

Keywords: *Rural energy; Policy; Institutional framework. 11 pages*

Hankins, Mark

A Case Study on Private Provision of Photovoltaic Systems in Kenya: In Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000.

Abstract: Fewer than 2 percent of Kenya's rural households have access to electricity from the grid. Efforts by the state monopoly to improve that figure by expanding the grid have had little effect, in part because the rural population is so sparse. Some rural households have turned to different suppliers with different technology-private companies providing photovoltaic systems. Since 1990, more than 2.5 megawatts of photovoltaic electricity have been sold in Kenya, mostly to households among the top 25 percent of rural income earners. The photovoltaic market has grown in stages as technological and commercial innovations have brought it within reach of lower-income users. Photovoltaic units have gradually become smaller and cheaper. Just as important, are the hire-purchase and finance agencies who have entered the market, enabling lower-income families to buy systems on credit. The government has largely taken a hands-off approach. That, combined with its liberalization of foreign exchange and import regimes, has allowed private entrepreneurship to flourish.

Keywords: *PV, Kenya, rural. 8 pages.*

Hosier, Richard H; Kipondya, W

Urban Household Energy Use in Tanzania: Prices, Substitutes and Poverty. In: Hosier, R.H., Luhanga, M.L. & Mwandosya, M.J. (Eds). Energy Policy Volume 12, NO. 5, 1993. Butterworth-Heinemann Ltd , Oxford.

Abstract: This paper presents the findings of Tanzania Urban Household Energy survey undertaken as part of the Tanzania Urban Energy Project Household energy use varies by income group according to local fuel availability .Considerable differences between the marginal costs of supplying fuels and market prices paid by consumers have led to major misallocation of resources. When the results of this survey are compared to the results of the 1987 household energy survey, a significant shift by households toward kerosene and electricity away from fuel-wood, charcoal and LPG is shown to have taken place. These shifts toward modern fuels are consistent with the claims of the household in the 1990 survey, and can largely be explained by fuel prices. Finally, an assessment of the lifeline tariff and the kerosene cross-subsidy demonstrate that the latter is more effective method of ensuring the basic energy needs of the urban rural poor.

Keywords: *household energy; interfuel substitution; energy subsidies. 20 pages*

Hosier, Richard H ; Mwandosya, Mark J; Luhanga, Matthew L.

Future Energy Developments in Tanzania: The Energy Cost of Urbanization. In: Hosier, R.H., Luhanga, M.L. & Mwandosya, M.J. (Eds). Energy Policy Volume 12, No 5, 1993. Butterworth-Heinemann Ltd, Oxford.

Abstract: This paper utilizes the detailed energy balance data developed as a part of Tanzania Urban Energy Project to examine future energy use in Tanzania. The energy costs of urbanization is shown to be quite substantial. National energy balances demonstrate that urban areas make up a large share of the composition of all fuels except woodfuel. As urbanization continues into the future, it will be accompanied by dramatic increases in the consumption of petroleum fuels, electricity and charcoal. For example using base case to business as usual assumption over a planning period stretching from 1990 to 2010, every 1% increase in the level of urbanization can be expected to lead to a 12% increase in electricity consumption, a 14 % increase in the consumption of all petroleum fuels and a 14% increase in the consumption of charcoal. Finally, the paper examines different energy policy options which are consistent with the stated energy policy. After the examination of a set of ambitious policy efforts, a set of feasible policies are tested and shown to have a significant impact on the goals of improving efficiency, obtaining the desirable national energy consumption profile and conserving indigenous wood fuel resources.

Keywords: *urban energy; energy scenario; costs of urbanization. 19 pages*

Hyman, Eric; Singh, Jas

The Senegal Diambar Stove Project. In: Boiling Point No. 35. Intermediate Technology Group Ltd, Rugby, 1995.

Abstract: This article is on a stove project that commenced in 1991 with funding from USAID/Senegal in collaboration with Appropriate Technology International (ATI). ATI worked directly with artisans and workshops in the manufacture of the stoves. The key success of the project was the transfer of the technology to small scale entrepreneurs to carry on with dissemination.

Keywords: *Senegal; energy; stove. 3 pages*

Intermediate Technology Development Group

Coal: A Suitable Substitute For Firewood? Intermediate Technology Development Group, United Kingdom, December 1992.

Abstract: The Botswana Technology Centre organised a seminar on Women Energy in 1991 whose main aim was to discuss the problems of women and energy and to find alternatives to woodfuel, currently the preferred source of energy particularly among low-income, rural householders. Overall, participants agreed that women should be involved in all energy matters relevant to their needs and called for more effective information dissemination on energy matters.

Keywords: *stove; coal; rural; Africa. 1 page*

James, B.

Current-Limited Supply: Can This Bring Electricity to Poor Households in Rural Areas? Energetic, No. 3, June 1997, University Document Management Services, South Africa, 1997.

Abstract: The electrification of rural areas is costly and the consumption of electricity by rural households is generally low. Eskom has therefore been obliged to examine strategies to reduce the costs of the rural electrification programme. One of these is to implement current-limited supplies of electricity in rural areas, particularly those which are far from the electricity grid and have low settlement densities.

Keywords: *electricity; Africa; rural. 3 pages*

James, B.; Ntute, P.

Rural Household's Response to 2.5A Electricity Supply Option in the Tambo Village Project. Energy and Development Research Centre, Cape Town, South Africa, May 1997.

Abstract: Tambo village is one of the sites where Eskom is piloting the current-limited supply of electricity. The report is based on three field trips taken and it discusses the status of development and service delivery at Tambo, revenue collection and customer service, the response to current-limited supplies and the effects of electricity on energy use.

Keywords: *electricity; Africa; rural. 45 pages*

Kalumiana, O

Policy Options for Increasing Electricity Access for Poor Urban Households in Zambia. AFREPREN, Nairobi, 2002.

Abstract: In Zambia, at least 56 percent of all urban residents are poor. Only 48 percent of the urban population has access to electricity. Urban residents in Zambia depend on four main fuels: electricity, charcoal, firewood and kerosene. Kerosene is mainly for illumination, electricity for both illumination and cooking while charcoal and firewood are used mainly for heat related end-uses, mainly cooking. Electricity is the most important lighting fuel for urban residents. Of the four types of fuels, electricity is subsidized.

Keywords: *energy; poor; poverty; electricity; kerosene; charcoal; urban; Zambia. 60 Pages*

Kalumiana, O.

Energy Services for the Urban Poor in Zambia. AFREPREN, Nairobi, 2002.

Abstract: There is a growing debate about the role of energy policy in tackling poverty. In its 2000 Energy and Development Report, the World Bank raised the following pertinent questions: Do energy policies and projects have a positive role to play in alleviating poverty? If they do, what kinds of policies and projects are likely to have the most beneficial - and sustainable - impact? And where should energy sector policy advisers focus their efforts? Included in this report is firstly, an introduction on energy and poverty and an overview of economic developments and indicators; secondly, a section on energy in the urban household context where energy consumption patterns among urban households and subsidies in the energy sector are discussed; and thirdly, a study of urban household energy service provision.

Keywords: *Africa; Zambia; poor; urban; household; electricity. 29 pages*

Karekezi, S.

Dissemination of Renewable Energy Technologies: The Role of Renewable Energy for African Development - Working Paper Number 10. Foundation for Woodstove Dissemination, Nairobi, Kenya, April 1993.

Abstract: Renewable Energy Technologies (RETs) have in the eyes of many not yet fulfilled their early promise in the early 1970s, RETs were seen as a panacea to the developing world's deteriorating energy situation. They were perceived to be a low-cost and appropriate alternative to conventional energy technologies and most important of all, suitable for use by the rural and urban poor of the third world.

Keywords: *Africa; rural; urban; RETs.*

Karekezi S.

Poverty and Energy in Africa – A Brief Review. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). Energy Policy. Vol. 30, Numbers 11-12, Elsevier Science Ltd., Oxford, 2002.

Abstract: The objective of this paper is to provide a summary overview of the African energy sector and briefly examine the nexus of poverty and energy in the region. While the paper uses continent-wide data, the emphasis is placed on sub-Saharan Africa- the region where the need to improve modern energy services for the poor is particularly acute. For readers who are unfamiliar with Africa, the paper starts with a succinct review of the continent's energy consumption and supply sub-sectors. It ends with the identification of key drivers that are likely to decide the future direction of the sub-Saharan Africa's energy sector. The paper stresses that these key drivers will, to a significant extent, determine the latitude that the region's decision makers will have in tackling the enormous challenge of meeting the modern energy needs of sub-Saharan Africa's poor.

Keywords: *Poverty; Energy; Africa. 4 pages*

Karekezi, Stephen, Kimani John

Energy Services for the Poor in Eastern Africa: Approach Paper for the Sub-Regional "Energy Access" Study of East Africa, AFREPREN, Nairobi, 2003

Abstract: The purpose of this paper is to present the approach and rationale for a study on

energy services for the poor in Eastern Africa. The paper starts by first providing a brief background review of the national incomes and energy consumption in Africa. It then discusses some of the key energy characteristics of the 3 distinct regions of Africa, namely: North Africa, sub-Saharan Africa and South Africa. Thereafter, the paper explains the rationale for the approach that the study on “Energy Access” in Eastern Africa as well as the reasons for selecting the three countries of Eastern Africa as the principal case studies. After presenting the rationale for starting with the power sector, the paper provides brief background reviews of the status of power sector reforms in the three countries of Eastern Africa, namely: Kenya Tanzania and Uganda. It then explains how the impact of power reform on the poor will be assessed and ends by discussing a few policy options for ensuring that the poor benefit from power sector reform. The study plans to examine, in some detail, the viability of these options as well as suggest additional options that are likely to arise out, of the study’s analysis. The appendices include a bibliography of relevant documents and data set that will be used in the study.

Keywords: *poor; Africa; reform; East Africa. 31 pages*

Karekezi, S.; Kimani, J.

Status of Power Sector Reform in Africa: Impact on the Poor. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). Energy Policy. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: Available research literature on power sector reform in Africa indicates that few African decision-makers question the underlying rationale of power sector reform. Many simply accept it as a given and concentrate on identifying measures that would expedite the reform process. This tunnel vision perspective undermines the possibility of developing more nuanced alternatives that can generate a wider range of options that reflect the region’s characteristics and institutional/management capacity. This article is based on a regional study by the authors reviewing the status, challenges and prospects of ongoing and planned power sector reform in eastern and southern Africa with special emphasis on the implications for the poor. Reforms have improved generation capacity as well as include poor performance at the transmission and distribution end, increased electrification of the poor and, and increased local participation in the power sector. There is inadequate information and data on how ongoing and planned power sector reform can be modified to address the aforementioned challenges, particularly with regard to electrification of the poor. This article suggests a number of measures that could allow the poor to benefit from power sector reform.

Keywords: *Electricity; Reform; Africa. 22 pages*

Karekezi, Stephen; Kimani, John; Wangeci, Jennifer (Eds)

AFREPREN Occasional Paper No.5: Power Sector Reform in Africa - Proceedings of a Regional Policy Seminar. AFREPREN/FWD, Nairobi, April 2001.

Abstract: This paper gives a comprehensive outlook on the issues affecting the power sector and the reasons why the policies governing the power sector should be reformed. One of the main objectives of the seminar was to review the current status of power sector reform in Africa and examine the impact of the reforms on three key challenges facing electricity namely; technical/financial performance, expanded electrification and local participation.

Keywords: *electricity; policy; reform; Africa. 73 Pages*

Karekezi, S.; Majoro, L.

Improving Modern Energy Services for Africa's Urban Poor. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). Energy Policy. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: The urban population of most sub-Saharan African countries is growing rapidly. It is estimated that urban growth rates are almost double the national population growth rates. As expected, urban energy consumption is growing rapidly, driven by the fast growth of urban centres. Although urban poor households in most cities of the region constitute over 50% of the total households, the provision of modern energy services to these households does not seem to be receiving the requisite attention from policy makers. This article provides a brief overview of the urban energy sector in Africa, with special emphasis on energy services for the urban poor. The energy-consumption patterns among the urban poor households and small and micro-enterprises are assessed and options for improving the provision of modern energy services to the urban poor are proposed. The article is based on field survey studies on energy services for the urban poor undertaken in Ethiopia, Tanzania, Uganda and Zimbabwe. Supporting data and information from other sub-Saharan African countries is used to validate key conclusions and recommendations.

Keywords: *Urban poor; Urban energy; Small and Micro-enterprises (SM_cEs); Africa. 13 pages*

Karekezi, S., Mapako, M., & Teferra, M. (Eds).

Energy Policy, Vol.30, No.11-12. Elsevier Science Limited, Oxford, 2002.

Abstract: This special edition starts with a brief overview paper that reviews key elements of the African energy sector. It briefly examines the nexus of poverty and energy in the region and presents important characteristics of the continent's energy consumption and supply sub-sectors. It ends with the identification of key drivers that are likely to decide the future direction of the sub-Saharan Africa's energy sector. Thereafter, the papers are arranged according to the following three main thematic sections, namely: i) impact of power sector reform on the poor; ii) energy services for the urban poor; iii) renewables and energy services for the rural poor. The thread that links all the three thematic sections is the focus on the provision of modern energy services to the poor of sub-Saharan Africa.

Keywords: *energy; poor; Africa; rural; equity. 232 pages*

Karekezi, S.

Renewables in Africa – Meeting the Energy Needs of the Poor. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). Energy Policy. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: This paper presents estimates of renewables energy technologies disseminated in sub-Saharan Africa and evaluates the potential of renewables in meeting the energy needs of Africa's poor. Using data mainly from eastern and southern Africa, the paper examines five major renewable energy technologies, namely: (i) large-scale biomass energy; (ii) small scale biomass energy (ii) solar photovoltaic; (iv) solar thermal; and (v) wind. It then evaluates how suitable each renewable energy technology is to meet the energy needs of the urban and rural poor. The paper ends with key measures that could encourage the large-scale dissemination of renewable energy technologies to the poor in Africa.

Keywords: *Renewable energy technologies; Africa; Poor. 10 pages*

Karekezi, S. ; Kithyoma, W.

Renewable Energy Strategies for Rural Africa: Is a PV-Led Renewable Energy Strategy the Right Approach for Providing Modern Energy to the Rural Poor of Sub-Saharan Africa?. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). Energy Policy. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: Rural areas continue to be home to majority of the population in Africa. The importance of providing modern energy to rural areas cannot, therefore, be overemphasised. Despite numerous efforts by Governments and donors in the region to promote solar photovoltaics (PVs) for rural electrification (almost every country in the region has had a rural electrification PV project), access to modern energy in rural Africa continues to be woefully low. In addition to being affordable to the rural masses, solar PV has the limitation that it can only be used for lighting and powering low-voltage appliances. This article reviews emerging trends in the rural energy sector of sub-Saharan Africa, and discusses the limitations of over-reliance on solar PV. It suggests possible options that could have greater impact on rural clean energy development. For the majority of rural households in the region, biomass fuels will continue to be the dominant fuel of choice. Efficient technologies for the use of biomass would, therefore ensure that scarce biomass resources are effectively utilised, and reduce the negative impacts of biomass use on women and children's health. Solar thermal, windpumps, micro-/pico-hydropower and cleaner fuels such as kerosene and LPG, have not received adequate attention from policy makers. These energy options could significantly improve the performance of rural small- and micro-enterprises. This article argues that rural energy policies that emphasise a broader range of renewables and target income-generating activities are likely to yield greater benefits to the rural poor than the current policies that rely on the solar PV option.

Keywords: *Rural energy; Rural poor; PV. 15 pages*

Katyega, Maneno

Improving Modern Energy Access to the Urban Poor in Tanzania. Journal of Energy in Southern Africa, Vol.12, No.3. Energy Research Institute, Cape Town, 2001.

Abstract: Tanzania has over the last four decades experienced high urbanisation trends. Energy use in the urban sector has been increasing with the urban population. This paper attempts to investigate the urban poor energy consumption patterns in relation to their incomes, their affordability of traditional and modern energy sources, and hence, policy options on how to improve their access to modern energy services.

Keywords: *energy; Africa; Tanzania; household; poor; electricity; urban. 11 pages*

Kayo, Dorcas

Power Sector Reforms in Zimbabwe: Will Reforms Increase Electrification and Strengthen Local Participation?. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). Energy Policy. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: Zimbabwe is a developing country currently in the grips of an economic crisis. The power sector has been starved of investments and there is an inadequate revenue flow into the country to finance new investments. Internal resources are inadequate to maintain the current system and to finance new investment. Financial and operational performance has deteriorated. Rural electrification is very low with only 18% of the population having access to electricity. The government and the utility, Zimbabwe Electricity Supply Authority

have recognised their inability to meet these challenges and have initiated a reform program in order to open up the power sector to private investors.

This article analyses the current technical and operational problems faced by the utility and their impact on its financial performance. In addition, the article reviews the status of electrification in Zimbabwe, and their participation of local private investors in the power sector. Policy recommendations on how the technical and financial performance of the utility can be enhanced and on how the rate of electrification, especially in rural areas, can be improved as presented. The increased participation of local private sector players into the power industry is a key issue and recommendations are made on how the government can provide incentives to facilitate their effective participation.

Keywords: *PSR; Local participation; Expanded electrification. 6 pages*

Kebede, B.; Bekele, A.; Kedir, E.

Can the Urban Poor Afford Modern Energy? The Case of Ethiopia. In: Fra Karekezi, S., Mapako, M., & Teferra, M. (Eds). Energy Policy. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: Comparing rough measures of costs of using modern fuels and purchasing power of the urban poor in Ethiopia, this article finds that, while kerosene is relatively cheap even for the very poor, electricity is extremely expensive even for the relatively well to do. The upper stratum of the poor may have the purchasing power to access butane gas. In addition, the article examines the relevance of the 'energy ladder' hypothesis. Generally, both at the aggregate level and for individual urban areas, the prediction from the hypothesis holds; but our results indicate the relevance of the hypothesis weakens on lower levels of aggregation implying significant intercity variations. Finally, demand equations for each fuel are econometrically estimated and the elasticities are used to examine price and income effects. The budget elasticities indicate that with economic growth, the demand for traditional fuels will increase. In addition, the cross-price elasticities show that increase in the price of a traditional fuel mainly shifts demand towards other traditional fuels rather than towards modern fuels. This slows down the transition towards modern fuels. The article concludes by presenting policy recommendations arising from the analysts.

Keywords: *Urban energy; Modern fuels; Ethiopia. 16 pages*

Kebede, Bereket; Bekele, Almaz; Kedir, Elias

Affordability of Modern Fuels, Patterns of Energy Demand and the Poor in Urban Ethiopia. AFREPREN, Nairobi, 2001.

Abstract: Comparing rough measures of costs of using modern fuels and purchasing power of the urban poor in Ethiopia, this article finds that while kerosene is relatively cheap even for the very poor, electricity is extremely expensive even for the relatively well to do. In addition, the article examines the relevance of the "energy ladder" hypothesis. Finally, demand equations for each fuel are economically estimated and the elasticities are used to examine price and income effects. The article concludes by presenting policy recommendations coming out of the analysis.

Keywords: *Africa; Ethiopia; urban; poor. 25 pages*

Kebede, Bereket

Modern Energy and the Urban Poor in Ethiopia: Literature Review and Empirical Analysis. AFREPREN, Nairobi, 2001.

Abstract: This third draft report is part of the "Energy for the Urban Poor" theme group. The first part examines at general issues in urban energy, both international and in Ethiopia. Even though some empirical data are used in this part, the main emphasis is on a review of literature. The first part concludes by identifying some of the gaps in the literature. The second part examines the affordability of modern forms of energy for the urban poor. In order to have a more profound understanding of the policy issues related to the provision of modern energy resources, the energy demand pattern of the urban population in general and the poor in particular is identified. This is done first by looking at energy budget shares and then by estimating demand equations in a multivariate econometric analysis.

Keywords: *Africa; Ethiopia; urban; poor; energy. 60 pages*

Kjellstrom, Bjorn.

Rural Electrification and FuelWood Related Deforestation in Tanzania. Stockholm Environment Institute Sweden October 1992.

Abstract: Electrification of rural villages and townships in developing countries can seldom be justified on financial grounds. This study shows the benefits of rural electrification. These benefits include the reduced use of biomass as a cooking fuel, less deforestation and less smoke exposure.

Keywords: *Africa; household; electricity; rural; environment. 23 pages*

Kyokutamba, Joan (Ed)

Proceedings of the Uganda National Policy Seminar on Energy Services for Small-Scale Enterprises. AFREPREN, Nairobi, 2002.

Abstract: Challenges that Small Scale Enterprises (SMEs) go through to access energy for production and the quality of energy they finally access were the central theme for this seminar. This publication is a report of the 2nd National Policy Seminar Report. The Minister of State for Energy opened the seminar. The seminar was interactive with half the time allocated for group discussions and the rest of the time used for plenary presentations. The first plenary session presentation was an overview of ongoing activities of AFREPREN (Appendix 1) followed by major research findings from the research study "Energy Services for the Urban Poor in Uganda". Some of the issues discussed in this report are: Commercial energy consumption among the urban poor in Uganda; Government policy on energy for small and medium scale enterprises; Efficient energy services for small-scale enterprises; Energy for the small scale enterprise sector in Uganda - the challenges.

Keywords: *energy; Uganda; SMEs; urban; poor; policy. 79 pages*

Lithole, C. T.

Rural Energy in South Africa. Journal of Energy in Southern Africa Vol.9 No.3 August 1998, Energy Research Institute, South Africa.

Abstract: Energy plays an important role in the development of rural areas. South Africa is a developing country with vast energy resources, particularly coal. This paper looks at energy used in rural settlements, and by farmers and farm labourers, with biomass as the main

energy source. It attempts to show that the supply of commercial energy resources in urban and rural areas is skewed. During the past three years, South Africa has supplied electricity to an additional 20% of people living in the rural areas. However, approximately 69% of rural people still do not have electricity and are hence denied its economic and social benefits.

Keywords: *traditional energy; commercial energy; rural energy; rural areas; urban areas; South Africa; rural electrification. 6 pages*

Mabaso, Fikile (Ed)

Electricity Regulatory Journal. National Electricity Regulator, Sandton, 2000.

Abstract: This journal contains articles on ESKOM price increase and ESKOM under new leadership. There is also an update on regional electricity regulatory association initiative, poverty challenge and EDI restructuring roadshows.

Keywords: *energy; electricity; Africa; South Africa; regulatory; poor. 8 pages*

Madzonga, Thammary Rudo

Assessment of the Extent to Which Power Sector Reforms have Led to Expanded Electrification Particularly Rural Electrification and for the Urban Poor. AFREPREN, Nairobi, 2002.

Abstract: The study explores the extent to which power sector reforms led to expanded electrification for rural areas and for the urban poor in Zimbabwe. The government came up with a national policy on the need for economic growth and the corresponding call for the implementation of sectoral improvements in the operational efficiency of the utility, ZESA. Power sector reforms facilitated an increase in electrification in both urban and rural areas. This was due to factors which came with power sector reforms particularly government support in the form of legal and regulatory processes to facilitate electrification and positive response by ZESA, in implementing government policy. For instance, the utility formulated and implemented a corporate plan with its attendant strategic objectives. The study also examined power sector reforms in the region as represented by three countries, these are, South Africa, Zambia and Tanzania. It was apparent from these countries that firm government support to the reforms was key to the success of the programmes and consequently to expanded electrification in the urban and rural areas. In Zimbabwe, electrification was accelerated due to a supportive financial policy in the form of a levy imposed on electricity bills as well as supportive institutional policy, which paved way for the formation of a Rural Electrification Fund Agency. Electrification for the urban poor on the other hand was facilitated by the review of the prevailing connection fee policy, wiring regulations and tariff policy among other things. From the findings, the study concluded that the effect of power sector reforms on both rural and urban areas was mainly due to the fact that such reforms were firmly supported by Government and consequently by the implementing agencies.

Keywords: *Africa; Zimbabwe; electricity; reforms; rural; urban; poor. 24 Pages*

Mariita, N.

The Impact of Large-Scale Renewable Energy Development on the Poor: Environment and Socio-Economic Impact of a Geothermal Power Plant on a Poor Rural Community in Kenya. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). *Energy Policy*. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: The article assesses the local environment and socio-economic impact of geothermal power plant on poor rural community in Kenya. The country's geothermal resources are located in the middle of one of Rift Valley's major wildlife parks-a major tourist attraction. Over the last two decades, the surrounding area has also become a major centre for Kenya's flourishing commercial flower farming, which is now partially powered by geothermal energy. This article examines environmental and socio-economic impacts on the nomadic low-income rural *Maasai* community of the simultaneous development of geothermal energy, flower farming and wildlife/tourism industry. While the near-term environment impacts have been minimal, the article warns of significant adverse impacts in the future if the competing demands of the fast growing geothermal energy, flower farming as well as wildlife/tourism sector are not adequately addressed. In the short-term, however, the socio-economic impact of geothermal energy development is likely to be the main source of conflict. The article ends by proposing policy and institutional measures that would ensure that the local *Maasai* community enjoys a wider range of socio-economic benefits as well as mitigate long-term adverse environmental impacts associated with geothermal energy development.

Keywords: *Poor; Geothermal; Kenya. 9 pages*

Mashange, K.

The Turbulent Liquid Fuel Industry in Zimbabwe: Options for Resolving the Crisis and Improving Supply to the Poor. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). *Energy Policy*. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: Towards the end of the last decade, supplies in petroleum fuel have been erratic to the extent that Zimbabwe has at times operated with as low as 40% of normal supplies. These shortages were attributed mainly to foreign exchange shortages and alleged mismanagement and corruption at the National Oil Company of Zimbabwe (NOCZIM). As shortages intensified, problems of product shortage began to unfold, which adversely impacted on the urban poor. The public began to question the industry's policies on the sustainability of the liquid fuel sector policies in Zimbabwe. Of particular concern was policies regarding regulatory mechanisms, pricing, distribution, utilisation of storage facilities, supply routes and NOCZIM management. This paper evaluates the challenges facing the Zimbabwean petroleum sector and presents recommendations that could assist in ensuring a robust and functional national fuel sector.

Keywords: *Liquid fuels; Reforms; Prices: Zimbabwe. 8 pages*

Massing, Andreas

Access to Energy for the Urban Poor: The Malian Case. Intermediate Technology Development Group, Rugby, 1999.

Abstract: This paper contains the terms of reference and a summary of the project. It also highlights information on urbanization, urban poverty, demand for fuel, supply and consumption levels, strategies and projects in the household energy sector and household economics and private energy consumption strategies. It also provides information on health and environment and presents some recommendations.

Keywords: *energy; Africa; Mali; urban; poor; 28 pages*

Matinga, Margaret (Ed)

Proceedings of the Malawi National Policy Seminar, 15th-16th July, 2002. AFREPREN, Nairobi, 2002.

Abstract: The Malawi National Policy Seminar focussed on the implications of the ongoing and planned power sector reforms in the provision of electricity services to the poor in Malawi. Case studies from Tanzania, Zambia and Zimbabwe were presented. Discussions centred on policy options and recommendations on how the reform process in Malawi could be streamlined. A review of the impact of existing policies on the provision of electricity services to the poor was discussed. Policy options that could enhance provision of electricity services to the poor were recommended. Barriers to local private investment in the power sector were highlighted and policy options that could enhance local private participation in the electricity industry reviewed. In addition, opportunities for local private investors to provide electricity services were identified. These outputs will set the stage for a more comprehensive seminar, to be organized later in conjunction with key stakeholders involved in the reform process.

Keywords: *Poor; Africa; policy; electricity; Tanzania; Zambia; Zimbabwe; Malawi; reforms.*

Matinga, Margaret

Implications of Power Sector Reforms on the Poor in Malawi: A Policy Study Paper. AFREPREN, Nairobi, 2002.

Abstract: The economy of Malawi has shown minimal growth since independence and has frequently shown signs of stagnation and in some cases, regression. This can be attributed to, among other factors, the fact that Malawi's economy is highly dependent on agriculture and is therefore highly susceptible to natural disasters. In addition, the agricultural activities that drive the economy are mainly subsistence farming activities and no value added activities are actively pursued. This results in exports being in primary form and therefore returning little value to the economy. Poverty is then an issue of concern in Malawi where an estimated 65.6 percent of the population living in poverty and 6.28 percent in ultra poverty. Energy use patterns for lighting and cooking activities in Malawi provide an indication of poverty levels in the country. The rationale behind the power sector reforms is the Malawi power sector has for a long time faced a number of problems that have invariably undermined its growth. Over the years, the national power utility has been beleaguered by crises of technical and financial performance as well as political press-ganging. Consequently, the utility has been unable to provide adequate electricity services to the rural and urban poor.

Keywords: *Africa; Malawi; reforms; poor; electricity; poverty; ultra-poverty.*

Matinga, Margaret Njirambo

Impact of Licensing Policy and Arrangements in Attracting Investment and the LRF in Provision of Services to the Poor. AFREPREN, Nairobi, 2002.

Abstract: The study endeavours to examine the outcome of power sector reforms in Malawi. In particular, the study looks at two pertinent issues. The first issue is whether the licensing policy and arrangement are clear, efficient and transparent enough to attract investors. Secondly, the study examines if the legal and regulatory framework prompted by the power sector reforms address the issue of delivery of services to the poor.

Keywords: reforms; Malawi; policy; poor; electricity. 72 Pages

Marandu, Edward E.

The Prospects for Local Private Investment in Tanzania's Rural Electrification. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). Energy Policy. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: The aim of this paper is to investigate whether local capability to establishing and managing power sector enterprises in Tanzania. The paper then examines the extent to which this capability could be harnessed to enhance rural electrification especially of the poor. The data used were obtained from interviews of power sector stakeholders. Three major conclusions arise from the findings. First, it seems that substantial local ownership is possible in small power enterprises but is limited in the larger ones. Second, available evidence suggests that the terms and conditions of local financial institutions are major constraining factors on the ability of local investors to mobilise finance locally. Third, it appears that, on the overall, technical, managerial and professional capabilities needed to set up, operate and manage Independent Power Production (IPP) and Independent Power Distribution (IPD) enterprises exist locally.

Keywords: power sector reforms; local participation; Tanzania; rural; electricity. 9 pages

Marandu, Edward E.

Improving Access and Affordability of Electricity to the Rural Poor in a Reforming Power Sector. AFREPREN, Nairobi, 2002.

Abstract: The broad purpose of this draft proposed study is to identify and investigate policy intervention options for improving access and affordability of electricity to the rural poor in Tanzania. The study is being conducted within the context of the reforming power sector. It is based on the assumption that electricity and other forms of energy are a necessary catalyst for development and thus have a positive role to play in alleviating poverty. Energy is seen as essential and without it societies can neither function socially nor commercially. It is estimated that 80 per cent of Tanzania's population live in areas where there is no public electricity supply and most of these areas are rural. It follows that; if the government is concerned with tackling poverty it should think about interventions to improve access and affordability of modern among its rural population.

Keywords: rural; poor; electricity; policy; reforms; Tanzania; Africa. 21 Pages

Mehlwana, Monga.

The Economics of Energy for the Poor: Fuel and Appliance Purchase in Low-Income Urban Households. Energy Development Research Centre, Cape Town, 1999.

Abstract: The main objective of this report is to provide an analysis of households' perspectives of energy efficiency based on qualitative research and built on the current knowledge provided by quantitative household energy research database.

Keywords: energy; household; Africa; poor. 20 pages

Mehlwana, Monga

Electrification of a Low-Income Area in Zambia: Evaluation of the Pamodzi Project. Energy Development Research Centre, Cape Town, 1999.

Abstract: This evaluation report assesses the following development aspects of the Pamodzi electrification project: the financial management of the project, the community participation and customer interface and the impacts of electricity in households' energy use patterns.

Keywords: *energy; electricity; Africa; Zimbabwe; rural; poor. 20 pages*

Milukas, Matthew V

Energy for Secondary Cities: The Case of Nakuru, Kenya. In: France, Nicky (Ed). Energy Policy Volume 12, No. 5, 1993. Butterworth-Heinemann Ltd, Oxford.

Abstract: Secondary cities are seen as an important focus for promoting a more spatially equitable pattern of economic infrastructure in developing countries, but their energy needs have not been given appropriate attention. This article presents research that was carried out in the East African secondary city of Nakuru, Kenya to determine patterns of energy demand and supply. Energy supplies used in Nakuru fall in two categories: industrial sources (electricity and petroleum) and traditional sources (wood, charcoal and agricultural residues). An overall energy balance is constructed for Nakuru, and it is then compared with those from other studies on rural Kenya and primate city of Nairobi. Nakuru is shown to rely on biomass fuels (charcoal) to a significantly greater degree than Nairobi. It is further shown that an environmental danger exists, as Nakuru's present demand for charcoal exceeds the regional capacity to provide long term sustainable supplies. A number of policy options are discussed that might contribute to solving the problem. The findings of Nakuru have wider policy ramifications: if secondary city development is promoted without an understanding of differences in energy-use patterns they exhibit, the pending environmental problems may increase dramatically.

Keywords: *secondary cities; energy balance; Kenya. 16 pages*

Muriithi, J

Women and Energy Project-Kenya: An Impact Study. In: Boiling Point No. 35. Intermediate Technology Group Ltd, Rugby, 1995.

Abstract: The women and energy project started in January 1983 as part of the special energy project in the Ministry of Energy of Kenya. The project had the overall goal of improving the living conditions of Kenya's rural population, the target being women, who are end-users of almost any energy consumed in the household. The project has had a strong and beneficial effect to the local economy as more people are using improved wood burning stoves.

Keywords: *Kenya; energy; stove. 2 pages.*

Nkambule, Ketlametswe

Consumer Response to Mobile Solar Water Heating in the Low-Income Sector in South Africa. In: Boiling Point No. 45. Intermediate Technology Group Ltd, Rugby, 2000.

Abstract: In South Africa, 15.5 million people live without indoor water and modern electric or gas geysers in their homes. This article presents a summary of a small consumer acceptance survey of mobile solar water heaters conducted in Johannesburg. It concludes that due to their simplicity, utility and low generation costs, low-cost water heaters offer a superb service to consumers.

Keywords: *South Africa; Energy; solar water heater. 2 pages.*

Ogunlade, Davidson; Sokona, Youba

A New Sustainable Energy Path for African Development: Think Bigger, Act Faster. Energy and Development Research Centre, Cape Town, 2002.

Abstract: This document provides some insights in developing a new energy growth strategy that addresses the urgency for Africa to depart from current paradigm that do not address major challenges of the energy sector which calls for not only satisfying energy needs but to assist the continent's overall productivity. The first chapter discusses the past imperatives that govern energy and development and then traces the origin of sustainable development before linking these thoughts to the African situation. Chapter 2 looks in some detail at the energy sources of the continent, and with the way energy is produced and used. The general energy policy environment is presented, with some comments on energy institutions. The third chapter looks at the major emerging issues facing the energy sector, which include the energy-environment dilemma, widening access to the majority of rural Africans, financing energy investments and regional cooperation and trade. Chapter 4 identifies the key lessons learnt from past energy initiatives in the continent: in energy institutions and reform, transitions in energy for cooking, oil and natural gas development, renewable energy development, modern biomass development and regional cooperation and trade. Chapter 5 contains the different components of the suggested strategy, which was based on the call for thinking for bigger energy projects in the continent. The main components are wide use of petroleum fuels, intense use of natural gas, optimal production and use of electricity, expanded use of LPG in households, more use of modern biomass, and converting flared gas to modern energy. The book concludes by looking at the future prospects in achieving the goals of the suggested strategy.

Keywords: *energy; Africa; rural; reforms. 72 pages*

Percy, Alan J.; Murray, Thomas P.

Rural Alternatives African Review December 1995/January 1996.

Abstract: An alternative form of low voltage overhead line construction which is bringing many benefits to villages in Ireland could have similar applications in rural areas of Africa. While the old traditional form has served the electricity supply industry for well over the last 60 or 70 years. it does have some deficiencies. It is vulnerable to damage from adverse weather, it can present a hazard when installed close to first floor level buildings; and in some locations to does readily provide the opportunity to make illegal connections. The new system is based upon "Equal wire ABC" (aerial bundle conductor) cable. This cable is constructed from aluminium conductors, insulated with XLPE insulation and typically is used in a four core "bundle" for three phase lines and a two core "bundle" for single phase lines.

Keywords: *electricity; Africa; rural; appropriate technology. 2 pages*

Philpott, Julia; Clark, Alix.

Electricity Reform with a Human Face. South Africa. In: Power Politics. World Resources Institute, Washington D.C, 2002.

Abstract: South Africa's unique colonial history, apartheid legacy, and ongoing transition to democratic governance drive the country's determination to attain its development objectives. The reform process is nascent in South Africa in comparison to many other countries and there is an ongoing debate over the electricity sector's ultimate governance structure. The government has begun framing reform around development objectives, such as black empowerment and electrification. The process is still in its early stages and so presents opportunities to contour it further to have a human face-one whose characteristics include a suite of public benefits-representative of all South Africans.

Keywords: *South Africa; Africa reform; electricity; development. 17 pages.*

Pierre, Jean ; Zekeyo, Ghonnang

Rural Electrification Reform and Programme in Cameroon – Paper presented at the African Highland Regional Meeting on Energy and Sustainable Development.

Abstract: This paper outlines the major restructuring options chosen by the government of Cameroon in the framework of the reform of its electricity sector, and analyses the potential of this reform to properly address the issues and challenges at the heart of the power sector and rural electrification development in Cameroon. One of these challenges is to provide at least minimum energy services, to allow the rural population to achieve a decent standard of living. After an overview of major issues confronting the electricity sector and rural electrification development in Cameroon, the paper analyses the reform of the electricity sector and other actions taken by the government to address these issues, and suggests a few options and strategies that may allow for increased access to electricity in rural areas

Keywords: *energy; electricity; Africa; Cameroon; reforms; rural. 8 pages*

Pineau, Pierre-Olivier

Electricity Sector Reform in Cameroon: Is Privatization the Solution?. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). Energy Policy. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.

Abstract: The economic difficulties of Cameroon and of its Government-owned companies led the International Monetary Fund (IMF) and the World Bank to set up a vast privatization program, with the Government's collaboration. In the electricity sector, the state had a complete control over the industry through the Societe National d'Electricite (Sonel), an integrated monopoly utility. Under the IMF-World Bank program, Sonel has been sold to foreign interests. This article presents Cameroon's electricity sector, the proposed reform and the importance of electricity in economic development. An evaluation of the reform is presented from two different perspectives. First, we consider the reform from a theoretical and market design point of view. Second, we challenge the reform from a more fundamental level, by questioning the relevance of privatization at this stage of the electricity sector development. This brings us to review the strategic place of electricity in economic growth, how different countries have dealt with their electricity industry in early development stage and how the objective of multinational corporations could be in conflict with specific electricity sector goals. From these two different perspectives, we conclude that the IMF and

the World Bank have set up a reform process that is against good public policy. We conclude with some suggestions for improving the reform process.

Keywords: *Cameroon; Electricity; Privatization; Reform. 13 pages*

Teferra; Mengistu

Power Sector Reforms in Ethiopia: Options for Promoting Local Investments in Rural Electrification. In: Karekezi, S., Mapako, M., & Teferra, M. (Eds). *Energy Policy. Vol. 30, Numbers 11-12, 2002, Elsevier Science Ltd., Oxford.*

Abstract: An estimated 13% of Ethiopia's population has access to electricity. Almost all electrified centres are urban, with rural areas as well as most small rural towns largely unelectrified. Rural electrification (RE) thus remains a major challenge to the power sector of Ethiopia. The national power utility (EEPCO) has traditionally been assigned the task of electrifying rural demand centres. EEPCO has, however, concentrated on the more developed and profitable urban areas. The objective of this article is to present the findings of a study that examined whether the ongoing power sector reforms in Ethiopia can attract private investment in RE as an alternative to the sole reliance on EEPCO. Initial findings on the study indicate the private investment in RE can be enhanced with some improvement in the legal and regulatory provisions, along with extension of technical assistance from EEPCO to private investors.

Keywords: *Rural electrification; Reforms; Ethiopia. 8 pages*

Tewari, D. D., Shab, Tushaar

An Assessment of South African Prepaid Electricity Experiment, Lessons Learned, and their Policy Implications for Developing Countries. In: France, Nicky (Ed) *Energy Policy, Vol. 31 No.9, Elsevier Science Limited, Oxford, United Kingdom, 2003*

Abstract: This study reviews the economics, logistics, and technology underlying the South African experiment of prepaid electricity. Although this experiment has benefited large masses of small and dispersed consumers, it has also generated a set of new problems that could not be visualized at the inception of the experiment. The success of this program can be largely attributed to a number of factors, including a good marketing campaign, innovative tariff schedules, better planning and management, and so on. Lessons learned from this experiment are useful for policy-making purposes in other developing countries of Africa and Asia.

Keywords: *policy; tariff; prepaid electricity; poor; South Africa; 17 pages*

Thom, C.; Wentzel, M..

The 2.5A Electricity Supply Option: Some Experiences in Mafefe. *Journal of Energy in Southern Africa.* Energy Research Institute, Cape Town, 1998.

Abstract: This case study looks at the 2.5A electricity supply option introduced by Eskom in the Mafefe Tribal Area in the Northern Province, South Africa. The 2.5A option offered an alternative to people who were very poor to the installation of prepayment meters. The study briefly describes the changes brought by the 2.5A electricity supply to the lives of some of the villagers.

Keywords: *energy; electricity; Africa; South Africa; income; poor. 3 pages*

Thom, C.; Banks, D. I.

Biogas as a Rural Domestic Energy Source: A Pilot Study. Journal of Energy in Southern Africa Vol.5 No.4 November 1994, Energy Research Institute, Cape Town.

Abstract: A household biogas plant was installed at the homestead of a rural family as part of a project funded by the Chief Directorate: Energy of the Department of Mineral and Energy Affairs. The Mathabela family operated the plant and utilized the gas for domestic purposes. During the first 18 months of operation limited monitoring of the system was undertaken, while the impact on the family was assessed over a period of two and a half years. The problems that were encountered related mainly to shortages of manure and water, as well as the maintenance and overall management of the biogas plant. This experience has indicated that the availability of sufficient quantities of manure and water from reliable sources presents greater constraints to the utilization of the technology by smallholders than anticipated. In addition, it recognizes that the skills and resources of the users are as critical to the successful implementation of the technology as the availability of the necessary inputs.

Keywords: *biogas; household energy; biogas plants; rural energy; costs. 6 pages*

Tremolet, Sophie

Multi-Utilities and Access: Can Private Multi-Utilities Help Expand Service to Rural Areas? Public Policy for the Private Sector Note No. 248. The World Bank Group, Washington D.C, 2002.

Abstract: In 1997, Gabon awarded the first real concession in Africa, under a contract that introduced coverage targets for expanding service to previously unconnected customers. The new concessionaire, offers both water and electricity service, with the electricity business cross-subsidizing the less developed water business. Five years on, concessionaire has performed well in established service areas, often exceeding targets, but has made less progress in more isolated areas. This Note assesses lessons for design of contracts with incentives of expanding service beyond the immediate major urban centres and on the potential role of multi-utilities.

Keywords: *water; electricity; Gabon; privatization. 4 pages*

Tresp, Nancy M.

Appropriate Technology International, No. 18. Appropriate Technology International, Washington D.C., USA, May 1989.

Abstract: Many small farmers in West Africa supplement their incomes and food supplies by raising vegetables such as tomatoes and onions during the dry season. This bulletin describes a low-cost, high volume foot-operated irrigation pump to be commercially manufactured and sold to small vegetable growers in Mali and North Cameroon. This low-cost pump fits a market niche between manual watering methods and expensive motor-driven pumps. Using the treadle pump, a farmer can irrigate a plot of land in less than one-third of the time required to manually irrigate the same area of land. With the time they save, farmers are expected to cultivate additional land, thus generating additional income.

Keywords: *rural; agriculture; Africa; appropriate technology. 4 pages*

United Nations Economic Social Council

Economic Viability of the Manufacturing of Turbines and Generators for Mini Hydropower in Africa. Presented at the Regional Conference of African Ministers Responsible for the Development and Utilization of Mineral Resources and Energy . United Nations Economic and Social Council, November 1995.

Abstract: The critical nature of the energy problem in most African countries is viewed today with great concern. In order to satisfy the basic requirements of the African Population, as well as to up-grade rural productivity, a greater amount of commercial energy consumption is necessary. However, due to scarcity of capital, resource constraints, technological deficiencies, and inadequate infrastructures the desired results cannot be attained. Developing African countries have to find other options to reach the rural areas with commercial energy at prices affordable by the users. The objective of this study is to assess the possibility that most African countries endowed with small hydropower resources can develop these resources to the economic benefit of the rural communities. Small hydropower plants (SHP) in this discussion include capacity sizes below 5000kw i.e. mini and micro hydropower plants are included in the definition.

Keywords: *hydro; Africa; rural; energy. 25 pages*

United Nations Economic and Social Council

Technical Study on Viability of Using Photovoltaic Energy for Rural Electrification in Africa, presented at the Regional Conference of African Ministers Responsible for the Development and Utilization of Mineral Resources and Energy. UNESCO, Accra, Ghana, November 1995.

Abstract: Energy supply for rural community is a major concern in most developing countries. For many years, rural electrification programmes implemented in most of African countries were mainly based on grid extension or installation of diesel generators for the supply of electricity to main rural centres. However, dissemination of photovoltaic energy systems is becoming viable in some African countries where adequate conditions exist namely financial schemes such as revolving funds or rural credit facility; appropriate implementing institutions involving rural associations and cooperatives and capability of local industry to produce and/or assemble some of the components of the systems. This paper reviews lessons learned on rural electrification programmes implemented in some African countries, the policies and strategies adopted for the dissemination of such systems on a large scale and measures being taken in order to make photovoltaic energy a viable option for rural electrification in the African context.

Keywords: *rural; Africa; electricity; solar. 28 pages*

United Nations; Economic Commission for Africa.

Energy in Poverty Alleviation and Sustainable Agricultural and Rural Development in Africa. Presented at the Regional Conference of African Ministers Responsible for the Development and Utilization of Mineral Resources and Energy, Accra, Ghana, 14-23 November, 1995. United Nations Accra, Ghana November 1995.

Abstract: A sustained 4% annual growth in agricultural production in Africa is considered a prerequisite for doubling aggregate output in a 20-year span towards attaining self-reliant overall security. Increased agricultural output would be a firm foundation for poverty alleviation and sustained rural development. The strategic focus of a programme implemented to double African agriculture output would give high priority in the household farming sub-sector. One major element of strategy would be improvement of rural access to

diverse energy supplies based preferably on local and national resources. Another strategy element would be selective improvement of traditional agricultural practices. Relieving the physical constraints of animate energy inputs of production, by implementing a low-input sustainable agriculture development strategy, appears to offer African countries realistic prospects of raising agricultural output towards the goals of achieving food security and self-reliance and poverty alleviation within an acceptable time frame.

Keywords: *Africa; rural. 11 pages*

van Horen, Clive; Eberhard, Anton.

Energy, Environment and the Rural Poor in South Africa. Energy For Development Research Centre, South Africa, 1994.

Abstract: The lack of adequate energy services imposes heavy social and environmental costs on poor rural households. The rural energy-environment interface, however, is prone to over-simplistic analyses, especially in the case of the 'fuel wood problem', and to a lack of research, such as in the case of the health effects of poor indoor air quality caused by wood fires. International experience suggests that deforestation is not necessarily an 'energy problem' - as in the cutting of trees for fuel wood - and therefore that it may not have an 'energy solution' - as in planting more trees for firewood. Instead wood scarcity must be analysed in the context of the multiple uses of wood resources, and policies must be multi-faceted if they are to succeed. The paper also shows that in addition to the environmental impacts of increasing wood scarcity and its social costs, borne largely by women, another serious problem arises from high levels of indoor air pollution caused by wood fires. These pollution levels may have enormous social and health costs, which have been largely unaccounted for to-date.

Keywords: *energy; South Africa; rural; Africa. 19 pages*

van Horen, Clive; Eberhard, Anton; Trollip, Hilton; Thorne, Stephen.

Energy, Environment and Urban Poverty in South Africa. In: France, Nicky (Ed). Energy Policy Volume 12, No. 5, 1993. Butterworth-Heinemann Ltd, Oxford.

Abstract: The high levels of inequality which characterize the South African political economy are reflected in its patterns of energy use and consequent environmental impacts. In spite of significant overcapacity on national electricity grid, two-thirds of households do not have access to electricity, and rely instead on dirtier and less convenient fuels such as coal. As a result urban space quality is severely degraded, with health guidelines for concentrations of particulate matter frequently being exceeded. Adverse effects on residents' health have been observed. On the whole, the impacts of a national electrification initiative is likely to be positive, although a complete switch to electricity may not occur immediately. It is argued that efficiency measures should form part of electrification initiative to ameliorate environmental costs. Finally, this paper considers some investment implications of mass electrification and concludes that the electricity supply industry itself has the means to bring about more equitable access to electricity services for the urban poor.

Keywords: *Household energy; environment; urban. 17 pages*

Wamukonya, Njeri

African Power Sector Reforms: Some Emerging Lessons. In: Prasad, K. Krishna (Ed), Energy for Sustainable Development, Vol.7 No.1, International Energy Initiative Inc., Bangalore, India, 2003

Abstract: Implementation of power sector reforms in Africa picked up speed in the 1990's. These reforms are driven largely by governments' need for development loans available from international financing institutions only upon commitment to reform. The main model advocated has been commercialization-followed privatization on the basis that the private sector is more efficient than the government. Reform promises better services, jobs, competition and lower tariffs. However, emerging lessons indicated cause for concern. Completion has hardly come into place. Instead there are shifts from government-owned monopoly utilities to foreign-controlled companies, some of which are in reality foreign-government monopolies. This has energy security implications. Financial instability suffered by many of these companies is placing these already economically unstable and vulnerable countries on a riskier path than before reform. The old utilities have not been particularly attractive to the private sector. This is mainly due to the small market sizes available since electrification rates are rather low. This has led to transfers of the utilities at unfavourable prices and conditions for the host governments. The socio-economic status related to the power sector has worsened as many employees are retrenched, tariffs rise and the majority of the population remains unconnected. A review of the reform process to integrate social and development needs is vital.

Keywords: *reform; Africa; tariff; 8 pages*

Wamukonya, Njeri (Ed)

Proceedings of the African High-Level Regional Meeting on Energy and Sustainable Development for the Ninth Session of the Commission on Sustainable Development. United Nations Environment Programme, Roskilde, 2001.

Abstract: This report presents the technical statements and papers prepared for the technical workshop 'African High-level Regional Meeting on Energy and Sustainable Development'. The papers follow the themes identified for the Commission on Sustainable Development (CSD 9) session but provide an African-specific perspective. In the region, increased access to energy is clearly still a major development issue and has strong links to another key theme - rural energy. A number of papers address these issues from the woodfuel or biomass side, as the majority of the rural population in African countries relies on this energy source and will continue to do so for the foreseeable future.

Keywords: *energy; Africa; rural; electricity; poor; gender; biomass. 188 pages*

Wolde-Ghiorgis W.

Options for the Provision of Modern Energy Services to Low-Income Rural Areas of Ethiopia. AFREPREN, Nairobi, Kenya, July 2001.

Abstract: This report focuses on testing the hypothesis that "decentralised private sector energy production and distribution have a better rate of success than centralised public sector initiatives in delivering modern energy to rural households and for income generating activities", and the associated issue of study is on "analysis of existing centralised public and decentralised private sector energy production and distribution activities in rural areas". The main thrust of this study is thus aimed at recommending policy issues that could promote options for the provision of modern energy services to low-income rural areas of Ethiopia.

Keywords: Africa; Ethiopia; rural. 63 pages

Wolde-Ghiorgis W.

Renewable Energy for Rural Development in Ethiopia: The Case for New Energy Policies and Institutional Reform.

Abstract: This article argues the case for introducing new energy policies in Ethiopia that will ensure energy initiatives for rural development meet the desired expectations. A review of the rural energy sector in Ethiopia is presented. Rural communities have for centuries relied solely on traditional biomass energy sources, human and animal power. In addition, sample findings show that the basic stock of traditional biomass energy resources is dwindling fast for two reasons: one due to rapid population growth, and two, due to the absence of energy substitutes for traditional energy sources. Renewable energy technologies and other modern energy technologies are almost non-existent. In terms of budgetary allocation, rural energy development has not received a fair share of public investment in comparison to education, rural road construction and health. A key policy recommendation made in this article is the need for commitment from concerned authorities to the use of renewables for spurring rural development. This could be done through increasing the budget allocation to rural energy, which is currently negligible. Other policy recommendations include the modification of existing institutional frameworks for rural energy delivery, and the design and implementation of appropriate rural energy initiatives suitable for productive activities and sustainable development.

Keywords: RETs; Africa; Ethiopia; energy; rural; poor; households.. 49 Pages

Zambia Electricity Supply Corporation Limited.

**Electrification of a Low Income Area in Zambia, Pamodzi Township Ndola
Zambia Electricity Supply Corporation Limited, Zambia, May 1997.**

Abstract: Electrification of Pamodzi township in Ndola is a pilot project designed to investigate the technical, fiscal and organisational viability of using the "readyboard" technology. The "readyboard" technology is a method of low cost wiring of low income urban households and the adoption of the deferred payment scheme. A total of 200 households in Pamodzi township have been earmarked for electrification using "readyboards". This article explains in detail the objectives of this project and how it is expected to run.

Keywords: Africa; electricity; Zambia; rural. 11 pages

3.0 ASIA AND PACIFIC

Alamgir, Dewan A.H.

Cost-effectiveness of Solar PV Program: The Case of Grameen Shakti in Bangladesh
Paper Presented in: The International Workshop on Dissemination of Solar
Photovoltaic Energy in Bangladesh, Dhaka 28-30 May 1999.

Abstract: This paper shows the cost-effectiveness of Solar Photovoltaic system as well as the cost-effectiveness of Grameen Shakti, a sister concern of Grameen Bank. It has been shown in this short study that customers, both households and entrepreneurs, can benefit from investing in PV systems. Households can enjoy better quality of light at a cheaper cost when the full life of PV module is considered. If social and health benefits accrued could be considered and better quality of light compared to kerosene-lamp-light quantified, the conclusion would be more favorable to PV systems. Similarly, a PV system can contribute substantial income to entrepreneurs with the right kind of micro-enterprises. What is needed is proper financing schemes for the customers, to make the systems affordable to enjoy benefits by larger number of customers. Grameen Shakti has also been able to recover full cost, both hardware and management cost, from income of its operation. This shows that PV program can be made financially viable without subsidy.

Keywords: *Subsidy, cost-effectiveness, entrepreneurs, sustainable income, PV. 8pages*

Amulya, Reddy K. N.

Indian Power Sector Reform for Sustainable Development: The Public Benefits Imperative. Energy for Sustainable Development Volume V No.2 June 2001, International Energy Initiative, Bangalore.

Abstract: The crises of utilities in developing countries led to a World Bank diagnosis of their problems and to a prescription of remedies for the situation. The resulting approach has been assessed with a case-study of the power sector in Karnataka carried out by the International Energy Initiative. This bottom-up approach has yielded remedies that do overlap with the top-down World Bank approach as far as liberation from government management control, corporatisation and the establishment of an electricity regulatory body are concerned. However, the bottom-up approach does not lead to other World Bank solutions such as unbundling of generation, transmission and distribution, removal of all subsidies and cross-subsidies, and privatization, which appear to follow, not from ground realities, but from global trends of reform/restructuring. It appears that the reform process in the industrialized countries has been driven primarily by technical developments, rather than by the financial crises that are the justification for reform in the developing countries. Despite this, there is an epidemic of reform in India. It appears that a bootstrap operation (=improving by one's own efforts) coupled with some elements of reform can rejuvenate the utilities. What may not result from this financial rejuvenation are several crucial public benefits – access, self-reliance/empowerment, environmental soundness, research and development and sustainability over the long term. To achieve these benefits, one has to go beyond economic growth and advance sustainable development. This larger goal requires that the invisible hand of the market has to be assisted by the visible hand of regulations and the intervention of the state. Privatization against this background may not be the magic wand that it is claimed to be.

Keywords: *electricity; policy; reform; India. 8 pages*

Asian Institute of Technology

Adoption of Good Practices as a Means of Enhancing Energy Access to the Poor. Asian Institute of Technology, Pathumthani, 2003.

Abstract: Energy is an essential input for economic growth of any country and well being of the human kind. Modern energy facilitates lighting, communications, health, food, education, industrial production, and transportation. However, these benefits have yet to reach more than two billion people around the world, of which 1 billion are from Asia. These poor people do not have money to buy improved energy services to make their lives better. In the absence of access to modern energies, the poor rely on traditional fuels to meet their cooking and heating needs. The main objective of this study is to prepare an inventory of good practices from South East Asia (which could be enlarged to cover other Asian countries at a later date) which resulted in better energy access to the poor. Good practices would include technological options, institutional and financing mechanism, and policy and other initiatives.

Keywords: *poor; Asia. 3 pages*

Asian Institute of Technology

Energy Situation in Selected South East Asian Countries. Asian Institute of Technology, Pathumthani, 2003

Abstract: South East Asia perhaps provides a widely varying picture in terms of economic development, energy resources and condition of the poor. On one hand, there are countries in the region with high per capita income and relatively high-energy consumption. On the other extreme, there are some other countries that fall in the lower income group. Some countries of this region (namely Indonesia, Malaysia and Brunei) are important producers and exporters of oil and gas in the region, while others depend mostly on imported fossil fuels. Lao PDR, Cambodia, Vietnam and Myanmar fall in the low-income category and have one of the lowest energy consumption in the world. Accessibility to energy services of the mass poor is an important factor to overcome the widespread poverty in these countries. In this country status report, Asian Institute of Technology (AIT) has focused on the energy situation of two poor countries of this region, namely Cambodia and Vietnam. The choice was mostly based on the availability of information. The situation in other poor countries of the region would be quite similar but information availability is a constraint for countries like Lao PDR and to some extent Myanmar. The status paper is organized as follows: section 2 presents the situation in Cambodia and section 3 presents the situation in Vietnam. Both sections provide information on country background, energy scenario, resource availability, policy reforms and financing cleaner energy services for the poor.

Keywords: *Asia; poor; poverty; policy; reform. 13 pages*

Barnes, Douglas

Political Involvement in Thailand's Rural Electrification, Fast Track Rural

Infrastructure On-Line[2000]Case Notes,

(http://www.fasttrackonline.org/case_notes_long/case_notes_long_c1134308.html)

Abstract: This case reviewed Thailand's experience with its rural electrification program. It is based on an ESMAP Joint UNDP/World Bank "Energy Sector Management Assistance Program. When the electrification program was initiated around 1972, only 10 percent of the Thai villages had access to electricity. By 1993, after only 21 years, the figure had increased to 97 percent. There are many factors, which contributed to making the Thailand rural electrification program the success that it was. The program was managed by a public

electricity distribution company (the "Provincial Electricity Company" - PEA), separate from that which served the Bangkok metropolitan area. The electrification program is deemed to have been carried out with a minimal amount of political interference in the village selected to be electrified. The credit for this achievement is attributed to two factors: the use of objective criteria for village selection and the system for "jumping the queue".

Keywords: *Electrification, Thailand, Asia, rural. 2 pages*

Barua, Dipal Chandra

Energy's Role in the Rural Income Generation: The Grameen Strategy. Presented in: The Village Power Workshop, 1998, Convened by NREL and World Bank, October 6-8, 1998.

Abstract: This paper briefly describes the off grid electricity program of Grameen Shakti (GS), a sister concern of Grameen Bank. Solar photovoltaic systems are most suitable for electrification of isolated remote areas in developing countries like Bangladesh. But people living in such underdeveloped areas can hardly meet the high cost of solar PV system due to poverty. By introducing innovative credit schemes Grameen Shakti has already sold 430 Solar Home Systems. From the paper, it is clear that solar electricity has helped a lot the rural people who are involved in business and other activities. Having access to electricity they can work at night and earn extra money. Electricity has improved children's education as well as the social status of the villagers. Grameen Shakti's effort helps rural people to achieve better quality of life. GS cannot change the whole scenario but at least it can demonstrate a way that creates an opportunity and hope for the rural people to alleviate their poverty and improve the life style.

Keywords: *Off-grid, credit, poverty. 10 pages*

Bell, J.

Cook Electric: The Ghandruk Experience, Intermediate Technology, Warwickshire, United Kingdom, 1994.

Abstract: Energy is fundamental to development because it allows people to do more with the resources they have. This is why reliable and accessible energy supplies are so important in enhancing the lives of poor people. Using the example of Ghandruk, a mountain village in Nepal, this booklet describes how one form of energy - micro-hydro energy - can help rural communities meet these needs. It also demonstrates how this power can be used for electric cooking, and the implications this has for saving fuelwood.

Keywords: *hydro; Asia; rural . 16 pages*

Cabraal, Anil; Cosgrove-Davies, Mac; Schaeffer, Loretta

Accelerating Sustainable PV Market Development. Paper Presented in: "Women Leaders on the Uptake of Renewable Energy Seminar", Asia Alternative Energy Program (ASTAE), The World Bank, Washington, D.C. 2001. (www.worldbank.org/astae/pvmarket.pdf)

Abstract: The Asia Alternative Energy Program (ASTAE) is a World Bank-donor initiative to support renewable energy and end energy efficiency investments in Asia. This article summarizes ASTAE's review of solar home system programs experience in Indonesia, Sri Lanka, the Philippines and the Dominican Republic. Successful PV market development for

rural electrification requires removal of financial and institutional barriers. The authors emphasize the need to overcome the initial cost barrier of solar home systems, establish responsive and sustainable infrastructure and ensure quality products and services. The article also identifies the economic niche for PV use in comparison to traditional options, such as kerosene lanterns and extension of the grid. Major obstacles to the diffusion of off-grid electrification via PV are discussed, along with recommended solutions and best practices. The authors have sought to apply these recommendations in design of the Bank-assisted Sri Lanka Services Delivery Project.

Key Words: *PV, off-grid, rural electrification. 8 pages*

Cabraal, Anil; Cosgrove-Davies, Mac; Schaeffer Loretta

Best Practice For Photovoltaic Household Programs: Lessons From Experience In Selected Countries. World Bank Technical Paper 324, The World Bank, Washington DC, 1996.

Abstract: This report identifies an important economic niche for photovoltaic (PV) systems within rural electrification programs. Chapter 1 sketches the evolution of household photovoltaic systems. Chapter 2 describes solar home systems, their costs, consumer perceptions and the potential niche for household PV in rural electrification. Chapter 3 analyzes the economics of solar home systems vis-à-vis grid and off-grid options. Chapter 4 outlines financial constraints to solar home system diffusion. Chapter 5 examines vehicles for program implementation. Chapter 6 sets out financing and cost recovery requirements. Chapter 7 focuses on technical standards. Chapter 8 lists the main conclusions and recommendations. Annex 1 summarizes the four case studies of household experiences in Indonesia, Sri Lanka, the Philippines, and the Dominican Republic. Annex 2 details the economic analysis and assumptions used to define the economic niche for solar home systems in rural electrification. It also examines the impact of productive loads and load growth on solar home systems competitiveness. The main conclusion of the report is that PV systems are a viable complement to grid-based energy service delivery and that within the rural electrification framework such systems can find a cost-effective niche and sustainable market.

Keywords: *Developing world, PV. 101 pages*

Cecelski, Elizabeth – Editor

Energia News, Vol. 5 Issue 2. ENERGIA Secretariat, Leusden, 2002

Abstract: The cover story is titled "The Asia Perspective: Integrating Gender into the Energy Sector". Other articles include: "International Programme: Focus on ICIMOD on Gender, Sustainable Energy and Water; Making a World of Difference in the Homes of a Few; Understanding Gaps for a Gendered Intervention in RETs in Mountainous Areas of Nepal; Internet Resources; Networking Around the World; Using Integrated Biogas Technology to Help Poor Communities – China".

Keywords: *energy; international; gender; RETS; poor. 24 pages*

Chakrabarti, Snigdha; Chakrabarti, Subhendu
Rural Electrification Programme with Solar Energy in Remote Region – A Case Study in an Island. Energy Policy Volume 30 Number 1 January 2002, Elsevier Science Limited, Dorset.

Abstract: In the programme of total electrification, centralized supply of power generated by conventional methods using exhaustible resources is proving to be uneconomic and, more importantly, unmanageable so far as supply to rural areas, particularly remote places, are concerned. On the other hand, the decentralized approach based on supply of power produced with renewable energy resources available locally is, for various reasons, gradually being recognized as a viable alternative for such remote places. The present paper attempts to examine, from a broad-based socio-economic and environmental point of view, the feasibility of decentralized solar photovoltaic (SPV) system as a source of power compared to that from conventional sources in a remotely located island. The study, based on a sample survey, conducted in an island called 'Sagar Dweep' in West Bengal, India, shows that within a short spell of time of four years, there have been noticeable improvements and significant impact on education, trade and commerce, entertainment, health etc. as a result of supply of power from SPV power plants. Productivity level of some agricultural activities as well as women's participation in different economic activities (at night) other than household work have shown definite signs of betterment. The SPV system is also superior to other conventional systems on consideration of its environmental effects. Thus, on the whole, there seems to be a strong case for the locally installed SPV system in spite of its current unfavorable position in respect of the direct cost of production.

Keywords: rural electrification; remote region; solar photovoltaic power plant. 10 pages

Energy Sector Management Assistance Programme
Rural Electrification and Development in the Philippines: Measuring the Social and Economic Benefits. Energy Sector Management Assistance Programme, Washington DC, 2002.

Abstract: Rural electrification is often a preferred program for promoting equity and economic development in poor countries. In most parts of the world, electricity is considered a modern source of energy, essential to development and areas in many ways, including improving business and farm productivity, enhancing convenience of household tasks, and providing a more efficient form of household lighting. Most people agree that the availability of electricity has at least the potential to improve quality of life and increase economic activity. Even so, some believe that the benefits of rural electrification programs have been disappointing. This study was initiated, in part, to develop methods for evaluating conflicting views toward rural electrification. Its principal objective was to develop a practical method by which to measure the benefits of rural electrification, including those that previous studies has classified as "unmeasurable". This method involved both formal and informal techniques of data collection; quantitative and qualitative methods of analysis; and attention to such concepts as quality of life, effects on education, and other key components of social development.

Keywords: electricity; Asia; Philippines; rural; socio-economic. 169 Pages

Goldemberg, J., Johansson, T. B.
Energy as an Instrument for Socio-Economic Development. United Nations Development Programme, New York, USA, 1995

Abstract: The document discusses energy and sustainability in terms of need for

sustainable human development, energy as an obstacle to improved living standards, the role of energy in deforestation and land degradation and energy needs for sustainable human development from an anthropological perspective. Part 2 of the book looks on how best to overcome the obstacles and has the following issues discussed in case studies:- energy efficiency to social utility the lessons from cookstove design, dissemination and use; PV, wind and other dispersed energy sources; renewable energy benefits rural women in China; and community biogas plants supply rural energy and water, the Pura village case study. These are small-scale in their approach. Part 3 of the book expands on the removal of the obstacles but this time through the large-scale approach which largely involves biomass conversion from liquid fuels and plantation energy systems.

Keywords: *biomass; rural; China; biogas. 112 pages*

Harper, Malcolm

'Micro-Privatising' Rural Power Distribution-Mass Produced Community Development in Orissa, India. In: Boiling Point No. 45. Intermediate Technology Group Ltd, Rugby, 2000.

Abstract: The electricity industry in Orissa state of India has been restructured and privatised for efficiency. But all this does not make a difference as most people who are electrified are illegally connected and invoiced power is less likely to be paid for. Generally corruption, inefficiency and incompetence still persist in the sector. Therefore micro-privatisation seems to be the only solution. The idea was developed after a study on a small village which decided to close the loopholes in the sector. NGOs later took the idea and together with the communities affected, they are changing the face of the sector.

Keywords: *energy; electricity; India. 2 pages.*

Irvine-Halliday, Dave; Craine, S

Demand Side Management for Rural Nepal. In: Boiling Point No. 45. Intermediate Technology Group Ltd, Rugby, 2000.

Abstract: Nepal has a long history in rural electrification particularly through the efforts of a micro-hydro industry. However, in recent years, there has been a slowdown in the number of micro-hydro plants being installed throughout the country. Many of the problems encountered result from a focus on the supply of power without analysing the demand. The article advocates for an investment in energy efficient lamps and demand side management as an important step towards the most economical and easily maintained rural lighting system.

Keywords: *Nepal; energy; efficiency; electricity. 3 pages.*

Joshi, B; Bhattacharya, P.; Roy, B. C. S.; Md. Uddin S.

Fuel Options for Household Energy in Northwest Bengal, India. Boiling Point BP43 1999, Intermediate Technology Development Group (ITDG), Bourton.

Abstract: This article is the offshoot of an RWEDP/FAO sponsored case study entitled 'Forest and displaced people: fuelwood collection and trade as a first step survival strategy' undertaken by the Indian Institute of Forest Management, Bhopal, India, in 1998-99. This study location, comprising three districts, is prone to the influx of a large number of people, who migrate under trauma and distress conditions, driven by the onslaught of natural and man-made catastrophes. Northwest Bengal is blessed with pristine, high forests covering

around 24% of the geographical area. Fuelwood collection and its trade from the State forests act as a safety net in the first step survival strategy of these displaced people.

Keywords: *fuel; household; energy; India. 4 pages*

Lalith, Gunaratne

Rural Energy Services Best Practice. Report Prepared For: USAID-Sari Energy Program Nexant Sari/Energy, 2002.

Abstract: In this Paper various rural electrification approaches and prevailing models in India, Bangladesh, Nepal and Sri Lanka are studied. Based on the study and analysis, grid-connected rural electricity distribution and off-grid integrated rural supply systems have been found to be the most successful and sustainable systems. It is also evident from the study that, off-grid decentralized systems using solar PV, off-grid centralized systems with micro hydro and grid connected delivery services, such as that of the Bangladesh Rural Electrification Board and the Rural Electric Cooperative Societies in India, have a role to play in the South Asian rural electricity sector. Some best practices are recommended in this paper from the rural energy practices, currently operating in the region for further developments to sustain or replicate in other countries of the region: Grid-connected rural electricity supply, based on Bangladesh Rural electrification model. Off-Grid centralized electricity supply, based on Micro Hydro mini grid systems in Sri Lanka & Nepal. Off-Grid decentralized electricity supply, based on Solar PV systems operating in Sri Lanka and Bangladesh.

Keywords: *Off-grid, micro hydro, PV. 10 pages*

Masjuki, H.H.; Mahlia, T.M.I.; Choudhury, I.A.

Energy Efficiency Programs For Household Electrical Appliances In Malaysia: A Methodology Guideline For Other Developing Countries. Proceedings Of International Conference On Domestic Use Of Electrical Energy, Cape Town, South Africa, 18 – 19 April 2000.

Abstract: Energy efficiency standard for household electrical appliances has implemented by many countries. Some countries are considering introducing energy efficiency standard and labels, despite very limited literature available relating to theory and methodology of development household appliances. This paper is a review of developing appliance energy efficiency standards and labels that are focused more on theory than use practical in development of energy efficiency standards and labels. Procedures for setting standards that are based upon those analyses are also discussed. The paper starts with the interpretation of standards and labels and its applications. At the end of the paper a minimum energy efficiency standard in the mathematical form a proposed in order to make it possible to calculate future needs and potential further energy and bill savings due to the standards. Additionally, the future direction of appliance standards are briefly discussed.

Keywords: *Efficiency, household electricity. 10 pages*

McMenemy, C; Williamson, M; Vitez, F

Rural Energy Development: An Integrated Approach in Nepal. In: Boiling Point No. 45. Intermediate Technology Group Ltd, Rugby, 2000.

Abstract: The article discusses two case studies in Nepal: The community based Economic Development project in Jumla and the community based integrated Energy Planning Project

in Lamjung. It discusses the role of electricity in development, its benefits, compares the two projects and concludes that electricity does offer benefits to the whole community.

Keywords: *energy; Nepal. 4 pages.*

Onn, Lim, Man

Pricing Electricity In Developing Economies: The Apec Experience Apec Energy Working Group Publication (2000).

Abstract: This paper discusses the state of electricity reform in six APEC developing economies and provides a backdrop on how each of these economies balance the need to use electricity tariff as an instrument of social policy with the drive for efficiency and market oriented electricity pricing. Of the six APEC developing economies examined, five are Asean economies; Indonesia, Malaysia, Philippines, Thailand and Vietnam and the sixth being China. The rapid economic expansion in the Asia Pacific region over the 1980's and 90's has led to significant demand growth for electricity. As a result, in much of the APEC region particularly in the developing economies, expansion of electricity infrastructure is now beyond the capability of governments and therein lies the inception of the independent power producers (IPPs) program in Asia. In many economies, particularly developing ones, the electricity sector has been used as an instrument of social policy. This takes various forms such as subsidized tariffs for certain group of consumers, preferential use of subsidized indigenous fuel costs and maintaining state-owned utilities which serve as employment providers. With the drive for efficiency and the need for market-oriented tariffs to attract investment of new generating capacity from IPPs, governments have begun initiating electricity reforms as incentives for private power development to support industrial and economic growth. When electricity reform is contemplated, it is difficult to maintain policies which result in severe market distortions. However, eliminating subsidies and allowing large numbers of electricity sectors workers to be laid off from state-owned utilities after introduction of competitive market structures have very real political and social repercussions.

Keywords: *IPPs, electricity, reform, tariff, subsidy, 16 pages*

Rai, Kavita

Rural Electrification in Nepal: Experiences of an Integrative Social Contextual Approach. In: Boiling Point No. 45. Intermediate Technology Group Ltd, Rugby, 2000.

Abstract: This article describes the way Nepal has been handling electrification projects. Rural electrification has been realised through integrated technology within a wider social strategic approach. It concludes by stating that low cost electrification technologies and their intervention must be continually assessed, researched, developed and disseminated.

Keywords: *Nepal; electricity; rural. 3 pages*

Rouse, Jon

Clay Grate Development in Chirabu Khera, India. In: Boiling Point No. 45. Intermediate Technology Group Ltd, Rugby, 2000.

Abstract: This article describes the, design, testing manufacture and promotion of a clay grate. The grate was developed as part of an improved stove for a project in Uttah Pradesh, India. The article concentrates on the ideas behind the development of a cheap alternative to the steel grate and various aspects of its development, manufacture and potential.

Keywords: *India; stove; energy. 3 pages.*

Sinha, Chandra Shekhar; Venkata, Ramana P.; Joshi, Veena
Rural Energy Planning in India: Designing Effective Intervention Strategies. Energy Policy Volume 22 Number 5 May 1994, Butterworth-Heinemann Limited, Dorset

Abstract: The conceptual and methodological issues in rural energy planning are examined with the purpose of facilitating the process of effective energy intervention design. It is suggested that effective energy intervention design in rural areas must be a component of the economic development plans of the area for which it is formulated – integrating energy sources and technologies should not be the compelling factors. The purpose of the intervention design would be to augment and facilitate economically productive activities in addition to fulfilling the subsistence requirements and improving quality of life. It is concluded that intensive intervention, implemented at the cluster of villages level by local institutions, supervised from the block, coordinated from the district, monitored at the state level and supported nationally appears to be the most promising combination for making effective interventions in the rural energy sector in the context of India.

Keywords: *rural energy planning; India. 12 pages*

Stone, J. L.; Ullal, H.S.
The Ramakrishna Mission Economic PV Development Initiative. Presented At: The 2nd World Conference And Exhibition On Photovoltaic Solar Energy Conversion Vienna 6-10 July 1998.

Abstract: India is the world's second most populous country, quickly approaching one billion persons. Although it has a well-developed electricity grid, many of the people have little or no access to electricity and all of the benefits associated with it. There are areas that are isolated from the grid and will not be connected for many years, if ever. One such area is the Sundarbans located in the delta region of the two great rivers, the Ganges and Brahmaputra, partially in India and partially in Bangladesh. It is estimated that 1.5 million people live in this area, crisscrossed by many islands and rivers, who have only marginal supplies of electricity generated primarily from diesel generators and batteries. Working with the regional non-governmental organization (NGO), the Ramakrishna Mission, and the West Bengal Renewable Energy Development Agency, the governments of India and the United States initiated a rural electrification initiative to demonstrate the economic and technical feasibility of photovoltaics to provide limited supplies of electricity for such applications as solar home lighting systems (SHS), water pumping, vaccine refrigeration, communications, and economic development activities. This paper details initial results from approximately 30 kilowatts of PV systems installed in the area, including socio-economic impacts and technical performance.

Keywords: *PV, developing countries, sustainability, 5pgs*

Tata Energy Research Institute (TERI)
Electricity Access by the Poor in South and South East Asia. TERI, New Delhi, India, 2003

Abstract: This approach paper aims to analyse at the regional level the electricity services and technologies currently available to the poor, and the electricity services and

technologies appropriate for the poor that respond to the needs of the poor and/or contribute towards poverty alleviation and sustainable development. In moving from the former to the latter, it attempts at developing a set of “acceptability criteria” based on certain attributes. That is, appropriateness for the end-user is determined on the basis of a set of attributes such as cost, availability, safety, and ease of operation-attributes, which, put together, determine technology acceptability to the end-user. Both domestic needs and community needs are taken into account, along with requirements for productive activities. The framework based on these criteria will be further elaborated upon in a subsequent and more detailed paper. Being an approach paper it does not at this stage, attempt to suggest specific policy options, as the information gathered to date may not be substantial enough. However, it puts together a quick review of the recent and past electricity sector reforms in the three countries and their impact on the poor. The final section provides some direction to the proposed nature of the policy options. Based on the acceptability criteria, having identified the technologies and services that are appropriate for the poor, the paper addresses the challenges that are faced in adoption of, and improving the access to these technologies and services by the poor.

Keywords: *policy; poor; electricity; reforms. 14 pages*

Urmee, Tania P.

Proceedings of the World Sustainable Energy Day, March 4-5, 1999, Wells, Austria, 1999.

Abstract: Energy is the most vital factor of national economy and development. Rural Bangladesh is deprived of electricity. Rural people represent 85% of the total population. Traditionally the rural people have been dependent on fuel wood and agro-residues –both due to poverty and due to lack of local fossil resources. Like all other developing countries Bangladesh also included renewable energy sources as an alternative energy source for the future. This paper presents the scenario of off-grid electrification in Bangladesh by Grameen Shakti (GS). Solar photovoltaic systems are most suitable for electrifying of isolated remote areas in developing countries like Bangladesh. But people living in such backward areas can hardly meet the high cost of solar PV system due the poverty. By introducing a soft loan procedure, Grameen Shakti is creating a small market for Solar Home Systems. By using solar electricity, the rural people who are involved in business and other activities are getting a lot of help.

Keywords: *RETs, PV, Bangladesh, rural, off-grid. Pages*

Wallace, W.L.; Jingming, Li; Shangbin, Gao

The Use Of Photovoltaics For Rural Electrification In Northwestern China, Presented At The 2nd World Conference And Exhibition On Photovoltaic Solar Energy Conversion 6-10 July 1998; Vienna, Austria, 1998.

Abstract: This paper focuses on the bilateral cooperation between the United States Department of Energy and China in providing assistance for the use of renewable technologies for rural electrification in northwestern China. The use of renewable energy technologies in China is becoming increasingly important to meet the needs of a large rural population. Solar and wind renewable resources in particular are available in regions of China that at present have no access to conventional grid power. Two regions in China that have an acute lack of electricity are a large region in northern and western China and the coastal island region of China. These regions have attracted the attention of the Chinese government in terms of increasing the quality of life and standard of living conditions of the

rural population. These regions have also attracted the attention of domestic Chinese companies and of international companies, governments, and multilateral development organizations as a potential market for renewable energy rural electrification systems.

Keywords: *PV, developing countries, sustainability. 7pages*

4.0 LATIN AMERICA

Aguilera, J.; Lorenzo, E.

PV Rural Electrification in the Bolivian Altiplane. Pergamon Press, United Kingdom, 1990.

Abstract: This paper presents a project carried out in the Bolivian Altiplane, under the auspices of the ICI, as a first step to analyse the convenience to use PVs for rural electrification purposes in this area. A total of 190 individual families and a farm-school have been electrified. A pilot assembling plant to manufacture ballasts and charge regulators has been set-up. The aptitude of the involved population is very good. The paper concludes that PVs is a mature technology suitable for undertaking the rural electrification of this area.

Keywords: *RETS; international; electricity; rural; Africa; Bolivia; Latin America; PV; book. 5 pages*

Altomonte, H.

Analysis of the Energy Policy Effects on Equity: The Case of El Salvador. UN, ECLAC, Division of the Environment and Natural Resources, Santiago, Chile, 1996.

Abstract: This document presents an analysis of the main consequences on equity in El Salvador as a result of the energy reforms. In spite of the fast economic growth observed in El Salvador in the last decade, the inequity in income distribution is still important. Nevertheless, the population has improved energy access, mainly as a consequence of the urbanization process and through the substitution of less efficient energy sources for more efficient commercial ones.

Keywords: *Energy, policy, equity, El Salvador, reforms, 59pgs*

Language: Spanish

Chisari, Omar; Estache, Antonio.

Universal Service Obligations in Utility Concession Contracts and the needs of the poor in Argentina's Privatisations. World Bank, Washington D.C, 1999.

Abstract: Even when a regulatory framework responds to the most generalised and solid practical and theoretical recommendations, it always requires some sort of adjustment to the specificities of each economy, such as its legal standards or socio-economic characteristics. In particular, social concerns should influence tariff design, the specification of the investment plans, and the definition of the social supply obligations for the operators. This paper is divided into three sections. The first section analyzes the conceptual aspects of Obligatory service. An attempt is made to define and distinguish the concepts of Obligatory service (OS) and Universal Service Obligation (USO). The second section summarises Argentina's Experience with Obligatory Service and Universal Service Obligation for the Water and Sewage, Telephony, Gas and Electricity sectors. It shows that this experience has generally been positive, although there are some outstanding issues worth discussing. The last section highlights the main lessons of Argentina's experience for countries following a similar infrastructure privatization strategy.

Keywords: *Latin America; utilities; Argentina; poor. 27 pages.*

Collins, A.

REPSource, Vol. 2 No. 4. Winrock International, Zrlington,, 1997

Abstract: The main theme of this newsletter is renewable energy technologies development around the world. In this issue, an interview with a USAID official discusses the opportunities for the renewable energy industry and also, a key issue that renewable energy can be a solution for both green and brown environmental issues. It also provides information on wind power projects, gender and solar pumping systems, rural electrification using solar PVs, and finally a discussion on how the commercialization of renewable energy can result in the improved quality of life.

Keywords: *Brazil; rural; electricity;. 12 pages*

Covarrubias, Alvaro J.; Reiche, Kilian

A Case Study on Exclusive Concessions for Rural Off-Grid Service in Argentina. In: Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000.

Abstract: Argentina, has been a leader among developing countries in reforming and privatizing the production and delivery of energy services-and is also taking an activist approach, poster form, to expanding rural electrification. About 30 percent of rural Argentinean's lack access to electricity services. The government is piloting schemes to award concessions to electrify rural markets of between 3,000 and 25,000 customers, potentially using a variety of technological options. A key innovation in this case is to award concessions to the bidder requiring the lowest subsidy, with the objective of creating incentives to identify cost-stages. But the initial evidence is that willingness and ability to pay fall well short of costs-suggesting that a major challenge for the future will be finding a sustainable source of financing for the subsidy.

Keywords: *Subsidy, developing country, rural electrification, Argentina. 8 pages.*

Enersol Associates, Inc.

The Introduction of Liquid Fuel Cook Stoves in the Dominican Republic: Improving the Quality of Life of Rural Families and Protecting the Environment. Enersol Associates, Inc. Washington D.C., 1996.

Abstract: Enersol Associates hypothesizes that there exists a significant opportunity to improve the quality of life of rural women and children of the Dominican Republic and protect both the local and global environment through the introduction of liquid fuel cookstoves as an alternative to traditional wood-burning stoves. This paper discusses the fact that Enersol wants to introduce liquid fuel cookstove to the Island.

Keywords: *Stove; Latin America; environment; rural. 4 pages.*

Estache, Antonio; Gomez-Lobo, Andres; Leipziger, Danny.

Utilities"Privatization" and the Poor's Needs in Latin America: Have We Learned Enough to Get It Right? World Bank, Washington D.C, 2000.

Abstract: This paper provides a tour d'horizon of the "utilities privatization" experience in Latin America, focusing on some outstanding issues surrounding its impact on the poor, and delves into the reasons why its benefits may be undervalued by some, especially the poor. The idea is not only to take stock but also to help policymakers improve the integration of

social dimensions in the reform of their infrastructure sector and the education of the voters on the extent to which this integration is taking place. The perception that privatisation policies hurt the poor is widespread in the popular press and is an important factor determining the political sensitivity of the reform agenda.

Keywords: *Latin America; poor; privatization. 32 pages.*

Foster, Vivien; Tre, Jean-Philippe.

Measuring the Impact of Energy Interventions on the Poor- an illustration from Guatemala. World Bank, Washington D.C, 2001.

Abstract: Following a decade of energy sector reforms in many developing countries, people are increasingly beginning to question the extent to which these reforms have benefited the poor. This question has proved difficult to answer, in part because of the absence of a framework for thinking about the issue, and in part because of a shortage of suitable data. Yet, ensuring that energy sector interventions are designed in such a way as to benefit the most vulnerable in society is important both from the perspective of social equity and because it is likely to affect the social acceptability- and hence ultimate sustainability- of reforms. This paper proposes a methodology for measuring the impact of interventions in the energy sector on the welfare of poor households.

Keywords: *Poor; reforms; Latin America. 45 pages.*

Fundacion Bariloche

Background Paper on "Energy Access": Case Studies for Latin America and The Caribbean (LA&C). Fundacion Bariloche, Argentina, 2003

Abstract: The access to comfortable, clean and efficient energy sources on the part of the poor has been defined as one of the highest political priorities in various world forums and analyses of this issue. What is intended is that around 2000 million inhabitants of developing countries should be able to access energy sources in a context where around 2800 million people live on less than 2 dollars a day. This report is a summary of the "Energy Access: Analysis of the Peruvian, Argentinian and Salvadoran Cases project in its present stage, as part of the Global Network on Energy Sustainable Development (GNESD). The main objective of this paper is to contribute to the effective design of policies that will promote and facilitate energy access on the part of the poor sectors of the population in a sustainable way from the economic, social environmental and political point of view.

Keywords: *poor; poverty; policy; population. 30 pages*

Global Environment Facility

Decentralized Rural Electrification Based on Renewable Energy. Global Environment Facility, Washington DC, USA, 1999.

Abstract: This is a proposal for PDF Block B Grant. It contains the project context, project objectives, proposed PDF activities, expected PDF outputs and PDF implementation arrangements. It also discusses the known barriers for the Use of Renewable Energy for Rural Decentralized Electrification in Paraguay.

Keywords: *energy; RETS; Latin America; Paraguay; report; rural; electricity; GEF. 13 pages*

Global Environment Facility

Rural Electrification with Renewable Energy through the Popular Participation Process in Bolivia. Global Environment Facility, Washington DC, USA.

Abstract: The full-scale project will establish renewable energy systems in selected areas of rural Bolivia; provide training for the design, management, and effective operations of these systems; establish a financing strategy in which renewable energy projects can be co-financed among participating communities among other issues.

Keywords: *RETS; Bolivia; Latin America; energy; rural; electricity; GEF; finance; report; report. 9 pages*

Harris, Clive

Private Rural Power: Network Expansion Using an Output-Based Scheme in Guatemala. Public Policy for the Private Sector. Note No. 245. The World Bank, Washington, D.C, 2002.

Abstract: In 1998, the Government of Guatemala privatized the two companies responsible for the distributing electricity in rural areas. The new owner, Union Fenosa, was obliged to implement an ambitious five-year rural electrification program. The goal: to increase the share of households with an electricity connection from 64 percent to 90 percent by 2004. Under this output-based scheme the two companies are paid US\$650 for each eligible residential connection made. If no connections are made, no payment is made. So far the scheme has performed well-completing 122,000 new rural connections between May 1999 and May 2002- and is on track for the 2004 targets.

Keywords: rural; electrification; electricity; household; Guatemala. 4 pages

Jadresic, Alejandro

A Case Study on Subsidizing Rural Electrification in Chile. In: Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000.

Abstract: Reform of the energy sector and reform of subsidies ideally go hand. Structural, ownership, and regulatory reforms aimed at making services more efficient should lead to rethinking of both the level of subsidy and the delivery mechanism. Chile, one of the earliest and most thorough energy reformers, has also been one of the more innovative in structuring its subsidy schemes. It has seen electrification as a key measure in alleviating poverty in rural areas-in 1992 about 47 percent of its rural population had no access to electricity. Its rural electrification program includes subsidies designed to be consistent with the broad principles of energy reform-decentralization of decisions to the regional and community level, competition (between technologies as well as supplies), as a requirement that all partners in the process-users and private companies as well as the state-contribute to the financing of expansion projects. The short-term results: an increase in rural electrification of about 50 percent in the first five years of the program.

Keywords: *Reform, structure, rural electrification, subsidy, Chile. 8 pages.*

Jadresic, Alejandro.

Auctioning Subsidies for Rural Electrification in Chile. The World Bank Group, Washington, D.C, June, 2000.

Abstract: Reform of the energy sector and reform of subsidies ideally go hand in hand. Chile, one of the earliest and most thorough energy reformers, has also been one of the more innovative in restructuring its subsidy schemes. It has seen electrification as a key measure in alleviating poverty in rural areas. Its rural electrification program includes subsidies designed to be consistent with the broad principles of energy reform – decentralisation of decisions to the regional and community level, competition (between technologies as well as suppliers), and a requirement that all parties in the process – users and private companies as well as the state – contribute to the financing of expansion projects. The short-term result: an increase in rural electrification of about 50% in the last five years of the program.

Keywords: *Electricity; Latin America; rural. 4 pages.*

Maldonado, P.; Marquez, M. Y. Jacques, I.

Energy and Equity, IDEE (Energy Economics Institute). In its Magazine: Development and Energy, Bariloche, Argentina, 1995.

Abstract: This document presents an analysis of energy and equity from the prospective of Latin America and the Carribean and propose alternative and indirect ways to measure the equity dimension in the energy sector. It also discusses the scope and adaptation of the different ways to approach the problem, considering several study cases in Chile.

Key words : *Latin America, Carribean, energy, equity. 10pgs*

Language: Spanish

Pistonesi, H.

Social Aspects of the Energy Policy: Colombian Case Study. UPME (Unit of Planning in Mining and Energy), Bogotá, Colombia, 1995.

Abstract: This document analyses the social aspects of the energy policy, while taking into consideration development aspects. Especially emphasized is the nexus among income distribution indicators and those corresponding to the concentration of consumption level in the household sector, for Colombian case.

Key words: *Energy, policy, Colombia, development, social. 36pgs.*

Language: Spanish

Schwartzman, Simon.

Expert Group on Poverty Statistics.

Instituto Brasileiro de Geografia e Estatistica, Santiago, 1997.

Abstract: This is a presentation which was set for a seminar on poverty statistics in Santiago, Brazil, 1999. The Working Group of the United Nations Statistical commission, in its last session in April, 1996, approved the recommendation to establish an Expert Group on poverty statistics to be chaired by Brazil, through the Brazilian Institute for Geography and Statistics, with the U.N Economic Commission of Latin America-ECLAC- acting as a Secretariat. The main goal of the ECLAC seminar was to compile the different measurements of poverty now being used in different countries of the world.

Keywords: Latin America; poverty; statistics. 7 pages.

**SEED (Sustainable Energy & Environmental Division)
To Combat the Poverty and to Improve the Environment at the Same Time. UNDP,
New York, USA, 2000.**

www.undp.org/seed/pei/newpublication/winwin.pdf

Abstract: In the framework of SEED the UNDP program analyzed how to combat poverty at the same time improving the environment, considering the role of renewable energy sources, more efficient technologies and better practices as well as productive uses of energy.

Key words: Poverty, environment, renewable.

Language: Spanish

**Sejenovich, H.; Gallo, Mendoza G.
Poverty and Environment: The Case of Argentina. CIEDLA/K. Adenauer Stiftung,
Bonn, Germany, 1995.**

Abstract: This document analyses how poverty could impact the environment especially in the case of biomass. Even when deforestation problem recognizes causes much more important than the energy use of biomass, certainly some negative externalities are derived from its use. The paper analyzes this topic in the Argentinean case.

Key words: Poverty, environment, Argentina, biomass. 59pgs.

Language: Spanish

**Suárez, C.E.
Energy Needs for Sustainable Human Development. IDEE (Energy Economics
Institute), Bariloche, Argentina, 1994.**

Abstract: The papers aim is to identify precisely the kind of energy needs which are sustainable for the human development and appeal to comparisons among developed countries and developing countries.

Key words: Energy, sustainability, developing countries. 20pgs.

Language: Spanish

**United Nations Development Programme
Removing Barriers to Rural Electrification with Renewable Energy. United Nations
Development Programme, Santiago, Chile, 1999.**

Abstract: There are an estimated 170,000 unelectrified households in Chile's rural areas. Since many of these households are in isolated areas, beyond the cost-effective reach of the electricity grid, community or individual systems will be necessary to electrify them. Renewable energy technologies would be less costly in certain locations. Several barriers are impeding the selection of renewable energy technologies for the electrification process. The proposed project seeks to remove these barriers and thereby make renewable energy technologies viable and practical options for rural electrification.

Keywords: *RETS; international; Chile; electricity; rural; Latin America; UNDP; report; household. 20 pages*

Wodon, Quentin, Ajwad, Mohamed I., Siaens, Cirinne
Lifeline or Means-Testing? Electric Utility Subsidies In Honduras. In: Brook, Penelope J., Irwin, Timothy.C. (Eds). Infrastructure for Poor People: Public Policy for Private Provision. The World Bank, Washington DC, 2003

Abstract: Many Countries around the world have implemented subsidies for utility consumption, especially in the case of water and electricity. Most subsidies take the form of a lifeline or increasing block tariff, whereby households that consume less pay less on a unit basis. The idea is that households with low consumption levels are likely to be poor, and some intervention is warranted to enable them to meet their basic needs at an affordable cost. Whether such subsidies are successful at helping the poor is not clear, as illustrated by the experience of a number of Central American and Latin American countries. In this chapter we assess the targeting performance of a similar subsidy for electricity implemented in Honduras. The rest of the paper describes the subsidy scheme and assesses its performance. It also illustrates how simple techniques based on so-called receiver operating characteristics (ROC) curves can be used to show how much improvement might come from an alternative way of targeting the subsidy.

Keywords: *utility; electricity; household; poor; Latin America; Honduras. 19 pages*

5.0 GLOBAL

Albouy, Yves; Nadifi, Nadia.

Impact of Power Sector Reform on the Poor: A Review of the Issues and the Literature. World Bank, Washington D.C, 1999.

Abstract: Opponents of the reform generally focus on its most immediate and visible impact, that is, the reduction in electricity price subsidies and the lower profile of governments in electrification programs. They tend to be less familiar of the reform indirect impacts and of hard won lessons of experience about the role of energy in development and the issues raised by energy subsidies. The literature and data reviewed here strengthens the presumption that the impact on the poor has been positive in countries where the reform is most complete and mature. While the direct impact is often a tariff increase for many users, in these cases, the poor were protected against increases or benefited as group from the improvements that reform brought about in the sector-better access and service- in government finances and in the economy at large.

Keywords: *Power; poor; developing countries; reform; energy. 12 pages.*

Baker, Bill, Tremolet, Sophie

Regulation of the Quality of Infrastructure Services in Developing Countries. In: Brook, Penelope J., Irwin, Timothy.C. (Eds). Infrastructure for Poor People: Public Policy for Private Provision. The World Bank, Washington DC, 2003

Abstract: This chapter examines the role and the design of quality of service regulation in the context of liberalizing and privatizing infrastructure and improving access to infrastructure services for the poor. A number of market failures provide legitimate motivations for overseeing the quality of infrastructure services, but the corresponding regulations often act against the interests of the poor. It also examines: the rationale for regulating the quality of infrastructure services; reviews the experience of quality regulation of infrastructure services in developing countries; discuss the record of main utility providers and points to cases where they have diversified supply quality to meet the needs of the poor; looks at alternative provider's quality of supply for services to the poor and ways they have been regulated; recommends an approach to quality of infrastructure services in developing countries with a view to addressing the needs of the poorest customers and highlights areas where further research is required.

Keywords: *poor; regulatory; developing country; utility. 41 pages*

Barnes, D; Van de Plas, R; Floor, W.

Tackling the Rural Energy Problem in Developing Countries. World Bank, Washington D.C, 1997.

Abstract: Helping people in rural areas gain access to energy is a great challenge, but the means available for realizing this goal have expanded considerably in recent years. As renewable energy systems come down in cost, they are becoming an increasingly attractive way to provide electricity to rural areas. The cost of grid electrification schemes can also be reduced to make electricity more affordable to a broader spectrum of rural people, and new, off-grid rural companies cooperatives can emerge if competition is promoted, barriers to entry are reduced, and the pricing playing field is leveled. Moreover, continued use of biomass need not deplete the environment, thanks to farm-forestry and forest management programs that involve farmers. Concerted efforts by governments, policymakers, the private sector, and NGOs, coupled with significant local participation, can lead to impressive results.

Keywords: *Energy; poor; rural. 9 pages.*

Barnes, Douglas F.; Halpern, Jonathan

The Role Of Energy Subsidies. In: Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000

Abstract: A first priority of energy policies aimed at alleviating poverty must be to bring down the costs of safe, clean, reliable energy services. Other studies discuss some promising trends in that direction, but low-income households must clear another high hurdle before they become energy consumers-the initial cost. They must pay to have gas or electricity connected, or buy a photovoltaic cell or LPG cylinder, and then buy the appliances that will run on the energy. Subsidies are thus likely to remain a key part of pro-poor energy policies in developing countries for sometime. Traditional ways of delivering subsidies, particularly cross-subsidization of consumption, often fail to help the poor. They are also less sustainable and make little sense once governments begin liberalizing energy markets. The challenge for governments is to find better ways of delivering subsidies, going back to basics on the question of whom to subsidize, which aspects of cost to subsidize and by how much, and how to deliver these subsidies. A "good" subsidy scheme is one that enhances access for the poor while sustaining incentives for efficient delivery and consumption. But that is not sufficient: the subsidy scheme must also be practicable within the financial and human resource constraints of the governments.

Keywords: *Subsidy, demand side, policy, poor. 8 pages.*

Barnes, Douglas,; Foley, Gerald

Rural Electrification In The Developing World: Lessons From Successful Programs. World Bank Case Studies, Infrastructure the Knowledge Base, The World Bank Group, 2000.

Abstract: This draft paper reports the best practices of grid based rural electrification. Rural electrification programs can undoubtedly face major obstacles. The low population densities in rural areas result in high capital and operating costs for electricity companies. Consumers are often poor and their electricity consumption low. Politicians interfere with the orderly planning and running of programs, insisting on favored constituents being connected first and preventing the disconnection of people not paying their bills. In spite of these problems, many countries have been quietly and successfully providing electricity to their rural areas. A series of case studies been done to identify the crucial factors determining the success of such programs. Certain clear lessons are already emerging like: Setting up effective institutional structures, Dealing with the political dimension, select Criteria for rural electrification, Emphasis should given on cost recovery, Charging the right price for electricity, Lowering the barriers to obtaining a supply, community involvement, Reducing construction and operating costs among others. There are major opportunities for increasing the pace and widening the scope of rural electrification. Well-planned, carefully targeted, and effectively implemented rural electrification programs provide enormous benefits to rural people. If these opportunities are grasped, it will enable large numbers of new consumers to enjoy the benefits of an electricity supply at acceptable costs and without burdening national governments and power utilities with unsustainable subsidies.

Keywords: *Rural, electrification. 4 pages*

Barnes, Douglas F., Floor, Willem M.

Rural Energy in Developing Countries: A Challenge for Economic Development. In: Annual Review on Energy and the Environment', Vol.21. Annual Reviews Inc, California, New Jersey, 1996

Abstract: The paper evaluates some successful programs and recommends that governments support market-oriented approaches that make the energy market equally accessible and attractive to local investors. Such approaches ideally improve access to energy for rural and poor people by revising energy pricing and by making the first costs of the transition to modern and more sustainable uses of energy more affordable.

Keywords: *developing country; electricity; rural; transport. 34 pages*

Barnes, Douglas; Qian, Liu.

Urban Interfuel Substitution, Energy Use, and Equity in Developing Countries: Some Preliminary Results. World Bank, Washington D.C., 1992.

Abstract: The limited understanding about nature of the energy transition hinders efforts to formulate policies concerning the most effective and socioeconomic strategy for providing energy for households in urban areas. Understanding the energy transition will help provide a framework for understanding the policy choices for urban areas. At what stage do the externalities caused by significant harvesting of wood around urban areas justify intervention to encourage households to switch to other fuels? At what level of income is it realistic to expect that households will switch from traditional fuels to modern fuels? Do different energy pricing policies have a harmful or beneficial impact on the poor? Do wood prices rise gradually in urban areas or do they suddenly shoot up causing problems for markets? Is there a role for government policy to direct the pace of the transition between fuels?

The findings in this paper are an initial attempt to answer some of these fundamental policy questions.

Keywords: *Urban; energy; policy. 25 pages.*

Bayliss, Kate.

Privatisation and Poverty: The Distributional Impact of Utility Privatisation. Working Paper No. 16. Centre on Regulation and Competition, Institute for Development Policy and Management, University of Manchester, Manchester, 2002.

Abstract: Privatisation has been a central component of donor-funded aid programmes since the early 1980s when the World Bank voiced its dissatisfaction with government efforts at public sector reform. This has been so much the issue so that its impact on the poor had not been considered. This working paper takes a critical look at privatisation and argues how and why it exacerbates the quality of life of the poor.

Keywords: *poverty; privatisation; World Bank. 21 pages.*

Bayliss, Kate

The World Bank and Privatisation: A Flawed Development Tool?

Public Services International Research Unit, University of Greenwich, London, 2000.

Abstract: Does privatisation effectively encourage development and reduce poverty? Should the World Bank's approach to privatisation be re-examined? The research analyses the fundamental areas of privatisation policy and practice, focusing in particular on Africa. It

analyses some of the fundamental parameters of privatisation policy in developing countries. It gives the findings and policy implication suggestions. The paper argues that privatisation as it is currently conceived by policy makers will not help and may even be detrimental to development projects.

Keywords: *Africa; policy; privatisation; poverty. 3 pages.*

Bayliss, Kate

Privatisation of Electricity Distribution: Some Economic, Social and Political Perspectives. Public Services International Research Unit, University of Greenwich, London, 2001.

Abstract: Electricity distribution privatisation is now on the increase. To date activity outside industrialised countries has centred on Latin America where mainly US and Spanish firms have been buying and trading distribution assets. Other regions are taking steps to open distribution to the private sector-often to meet the demands of international donors. This paper reviews international progress in privatisation and considers some of the realities of such a policy.

Keywords: *policy; energy; efficiency; international. 29 pages.*

Besant-Jones, John; Brook, J. Penelope.

Reaching the Poor in the Age of Energy Reform. World Bank, Washington D.C, 2000.

Abstract: The link between energy programs and poverty alleviation is well understood-and more likely to provoke debate and soul-searching among many specialists. That access to better and cheaper energy services improves the welfare of the poor seems obvious. But how can we identify the less direct effects of changes in the sector on the poor-particularly the effects of recent sectoral reforms? This report focuses on clarifying the following issues: what role access to efficient and sustainable energy services can play in strategies for reducing poverty, and what role liberalizing energy markets can play in improving this access; how programs for liberalizing energy markets can improve options for expanding access to energy services for the poor; and what the key challenges-and key energy policy instruments-are in strengthening support to the poor.

Keywords: *Energy reform; poor; poverty. 5 pages.*

Brook, Penelope J.; Smith, Warrick P.

Better Energy Services for the Poor: In Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000

Abstract: Governments around the world rich and poor alike confront the challenge of ensuring that their people have access to clean, efficient, reliable, and affordable energy services. This challenge is particularly acute for developing countries and for low income households and communities where density, distance, and resource availability raise costs above local ability or willingness to pay. There is a rich body of experience with different policy responses to this problem. But do current approaches take sufficient account of the new opportunities arising from rapid changes in technology and economic thinking? This paper outlines those opportunities, explores some of the new directions open to policymakers, and considers some of the implementation challenges.

Keywords: *Energy services, poor, technology. 6 pages*

Brook, Penelope J.; Besant-Jones, John

Reaching the Poor in the Age of Energy Reform: In Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000

Abstract: Throughout the industrial era investments to expand and improve energy services have been a mainstay of economic and social development policy in emerging and industrial countries alike. By expanding access to reliable sources of energy-gas, electricity, petroleum products-for agriculture, industry, commerce, and households, governments have primed growth in productivity and output. But in recent years the focus of their interventions has shifted from investing public funds in large-scale energy projects to mobilizing private investment and adopting commercial standards through structural, regulatory, and ownership reforms. Whatever the approach, the link between energy and economic development remains indisputable (World Bank 1994). The link between energy programs and poverty alleviation is less well understood-and more likely to provoke debate and soul-searching among energy specialists. That access to better and cheaper energy services improves the welfare of the poor seems obvious. But how can we identify the less direct effects on the poor of pro-growth, pro-efficiency reforms against those of direct interventions aimed at improving the poor's access to modern energy for consumption and productive uses? This paper seeks to answer this.

Keywords: *Reform, poor, private investment, energy services.4 pages*

Brook, Penelope J., Irwin, Timothy.C. (Eds)

Infrastructure for Poor People: Public Policy for Private Provision, The World Bank, Washington DC, USA, 2003

Abstract: In the last two decades many governments have allowed private companies to provide infrastructure services previously provided only by state owned businesses. In some cases they have privatized state-owned business under long-term concession or lease contracts. In others they have allowed private firms to compete alongside former government monopolists. Although private participation in such infrastructure industries as electricity, water and telecommunications has often led to improvements-such as lower costs and better services-it has also been controversial. Among other things privatization entails a more commercial approach to the provision of the services, which can lead to the disconnection of nonpaying customers, and reluctance to connect new customers unless they will be profitable. As a result observers have raised concerns about its effects on the poor, irrespective of its possible benefits in other respects. The chapters of this book examine the data on infrastructure and the poor in developing countries and consider how policies entered on private provision can address their needs. Many of the chapters focus on the extent to which the poor have access to infrastructure services of reasonable quality for example, to water that is safe to drink, to a reliable source of electricity, and to a nearby telephone. Access to such services is of course, not the only infrastructure issue that matters to the poor; the poor who already have access to modern services care, for instance, about the price and reliability of those services. However, in most developing countries access is the key issue. In these countries most of the poor have no access to standard infrastructure services provided by utilities. Instead they often pay high prices for lower-quality substitutes. The lack of ready access to good basic infrastructure services can directly reduce the well being of the poor. For instance, unsafe water and sanitation not only cause disease, but also hamper their chances of rising out of poverty.

Keywords: *poor; policy; water; privatization; electricity; telecommunications; disconnection;*

developing country; utility; poverty; women; education. 19 pages

Cape Technikon

Proceedings on an International Conference: Towards a Sustainable Energy, Solutions for the Developing World. Cape Technikon, Cape Town, 2-3rd April, 2002.

Abstract: These are proceedings of the tenth conference on the domestic use of energy which was held in Cape Technikon, Cape Town, South Africa. The following papers were presented: " Demand-side management and implementation strategies-The position of measurement and verification in demand-side management projects in South Africa; Tariffs and metering-Optimal active power dispatch as a means of reducing electricity energy consumers tariff in Botswana; Measurement and verification of the electricity consumption of Volkskas center in Pretoria using different approaches; Electronic metres and automatic meter reading system; Electrification and energy provision in rural areas-Rural energy in Nigeria: The electricity alternative, Evaluation of performance of stand alone induction generator for usage of small-scale rural electrification, Domestic biogas digesters: A comparative case study, Energy alternatives for water pumping in rural areas-using a case study approach, Implementation of solar home systems and lessons from Zimbabwe, Government policies and Grid extension as solutions for availing energy services for the urban poor, Integration of mini-hydropower in electricity distribution networks. Other papers presented were on:- Energy policies, including electricity industry restructuring; Domestic appliances and efficient energy use; Renewable energy and Africampus

Keywords: *energy; Africa; tariffs; poor; petroleum, RETs, urban; electricity; rural; policy; Ghana; Zimbabwe; Brazil; solid waste; Malaysia; Nigeria. 124 Pages*

Cecelski, E.

Enabling Equitable Access to Rural Electrification: Current Thinking and Major Activities in Energy, Poverty and Gender. Energy, Environment Development, Leusden, Netherlands, 2000

Abstract: This briefing paper summarizes current thinking on energy, poverty and gender. The emphasis is on rural electrification with alternative energy, based on ASTAE's comparative advantage historically. Nonetheless it should be kept in mind that this is only a narrow slice of the reality of rural energy poverty, and this is noted where appropriate.

Keywords: *electricity; international; rural; poverty; . 38 pages*

Cecelski, Elizabeth

Enabling Equitable Access to Rural Electrification: Current Thinking and Major Activities in Energy, Poverty and Gender. Briefing Paper prepared for a Brainstorming Meeting on Asia Alternative Energy Policy and Project Development Support, Asia Alternative Energy Unit ,The World Bank, Washington, DC, 26-27 January 2000

Abstract : This paper reviews current thinking on energy, poverty and gender, with a focus on rural electrification and renewable energy, as an initial attempt to conceptualize linkages and needs in this area. Gender and poverty challenges in energy access are arising in the context of renewed interest in rural electrification, especially renewable energy, as a tool both for sustainable energy development and for greater equity in rural areas. Poverty reduction and gender equality are now integral goals for all major development institutions. Energy programs are seeking models and approaches to respond to these mandates.

Keywords: Gender, energy, poverty. 38 pages

Cecelski, Elizabeth (Ed)

Energia News, Vol. 5 Issue 3. ENERGIA Secretariat, Leusden, 2002.

Abstract: Articles provided in this issue include: "Operationalising gender and poverty approaches; International programmes: Focus on Asia alternative energy program of the World Bank: Energy, poverty and gender work; Networking around the World; Women's energy use: Evidence from poverty afflicted areas of rural China; EnPoGen study in Indonesia; EnPoGen study in Sri Lanka; Demand-focused framework for designing, monitoring and evaluating rural electrification projects; Internet resources; Enabling equitable access to rural electrification: Current thinking on energy, poverty and gender."

Keywords: energy; gender; poverty; rural. 24 pages

Cecelski, Elizabeth.

ENERGIA News, Vol. 4 Issue 4. Energia Secretariat, Leusden, the Netherlands, December, 2001.

Abstract: This issue of Energia News focuses on issues related to gender, energy and health in relation to indoor pollution caused by smoke from cooking using traditional biomass fuels. The articles include; Gender differences in the impact of biomass fuel on health, Gendered sights and health issues in the paradigm of biofuel in Sri Lanka, Health implications for women and children of woodfuel use in Cambodia, Solar disinfection of water in Latin America benefits women and their families, and Rural electrification in South Africa and Tunisia.

Keywords: Rural; electricity; stove; Latin America; Africa. 24 pages.

Cecelski, Elizabeth; Grant, Ian.

Energy and Rural Women's Work. In: Boiling Point, Journal No. 11. Intermediate Technology Development Group, Berk, U.K, 1986.

Abstract: This paper deals with national energy balances, with particular emphasis on the role of rural women as energy users; the impact of fuel shortages on the living conditions and health of women in poor villages.

Keywords: Asia; Africa; stove; rural; Latin America. 2 pages.

Cecelski, Elizabeth

The Role of Women in Sustainable Energy Development. NREL Subcontract Report, June 2000

(www.doe.gov/bridge).

Abstract: Renewable energy will play an increasingly important role in both developing and developed countries in the future. The different implications of the wider use of renewable energy sources for women and men have hardly been examined, even though women's roles and interests in energy use and production have been well-documented. Experience in other sectors, and anecdotal evidence from the energy sector, suggest that women indeed have an important role to play in sustainable energy development. This paper, originally

prepared to address the concerns of renewable energy technical experts at the World Renewable Energy Congress, reviews the literature on women involvement in renewable energy and presents some examples of the results of including or excluding women in renewable energy development. It addresses four questions: Why do women need renewable energy? Are women really interested in renewable energy technologies (RETs)? Will women automatically benefit from RETs? Why is the gender perspective relevant in the energy sector?

Keywords: *RETs, women, gender. 38 pages.*

Clancy, Joy; Rebedy, Lucy.
Electricity in Households and Micro-Enterprises. Intermediate Technology Publications, London, 2000.

Abstract: This book is designed for people with little technical background on previous knowledge of electricity and the technologies used to generate it. The aim is to raise awareness of the capabilities of these technologies and to help in making informed decisions about the different options.

Keywords: *energy; electricity; international; household; SMEs; rural; urban; poor; 104 pages*

Clarke, George R. G., Wallsten, Scott J.
Universal Service: Empirical Evidence on the Provision of Infrastructure Services to the Rural and Poor Urban Consumers. In: Brook, Penelope J., Irwin, Timothy.C. (Eds). Infrastructure for Poor People: Public Policy for Private Provision. The World Bank, Washington DC, 2003

Abstract: This chapter reviews the evidence on universal access in developing countries. It first discusses the rationale for universal access laws and review the different ways subsidies can be financed and allocated, along with the implications of these various methods. It then evaluates the historical effectiveness of monopoly enterprises in providing service to the poor and how privatization has affected coverage. Overall It finds little evidence that subsidies have actually been used to meet universal service goals under monopoly provision: outside Eastern Europe, infrastructure connections to rural areas and urban areas and the poor are distressingly low.

Keywords: *poor; developing country; Infrastructure; rural; urban. 54 pages*

Cook, Paul; Uchida, Yuichiro.
Privatisation and Economic Growth in Developing Countries. Working Paper No. 7. Centre on Regulation and Competition, Institute for Development Policy and Management, University of Manchester, Manchester, 2001.

Abstract: Privatisation spread through much of the developing world in the 1990s. Has it promoted efficiency? Have developing countries developed competition policy and regulatory regimes to take advantage of the potential benefits of privatisation? The paper carries out an analysis and indicates that further policy research is needed into the roles played by competition and its regulation in order to understand the relation between privatisation and economic growth.

Keywords: *efficiency; regulation; international. 3 pages.*

**Department for International Development
Energy for the Poor. Department for International Development, Glasgow, 2002.**

Abstract: This report is a consultation document which contains articles on: The importance of energy access for the poor; Energy services and energy poverty - the impact on people's lives; Getting energy services to the poor - reducing the costs; Integrating people-centred energy planning into development plans; The way forward - a new approach to energy; and a role for Department for International Development (DFID)

Keywords: *energy; international; poor; planning; environment. 18 pages*

**Department for International Development
Energy for the Poor: Underpinning the Millennium Development Goals. Department for International Development, London, 2002.**

Abstract: This document highlights some of the ways in which access to clean, efficient energy services can tackle poverty and make a difference to poor people's lives. It discusses: The importance of increasing access to energy services; The effectiveness of energy sector management; Attracting more capital to increase energy access; Making subsidies and other policies work for poverty reduction; Making energy services affordable; The way forward - a new approach to energy.

Keywords: *energy; international; poor; privatization; regulatory; policy. 31 pages*

Dubash, Navroz K.

The Public Benefits Agenda in Power Sector Reform. Energy for Sustainable Development Volume V No.2 June 2001, International Energy Initiative, Bangalore

Abstract: Over the last ten years, long-held assumptions about the structure of the power sector have overturned. In place of publicly-owned vertically integrated monopolies, a new model of private ownership and competition is emerging. This paper analyses the eclipse of the old model, the forces that have led to emergence of a new model and the role of donor agencies in the process. The paper also argues that public benefits must be explicitly provided for in privatized, competitive structures. These benefits include environmental, social and governance concerns. The paper discusses the issues at stake in each of these areas.

Keywords: *electricity; reform; policy. 10 pages*

Ehrhardt, David.

Impact of Market Structure on Service Options for the Poor. Infrastructure for Development, London, 2000.

Abstract: Pro-poor issues should be considered as part of an integrated approach to structural reform. This will ensure that pro-poor structural reforms are compatible with the overall approach. For example, it should result in regulation that focuses on network access and is not too onerous for informal vendors and a subsidy regime that is robust to the degree of entry and competition being envisioned. This paper analyses key pro-poor structural issues Governments should consider when planning to introduce private participation in network utility industries.

Keywords: *Poor; utility reforms; infrastructure. 26 pages.*

Ehrhardt, David

Impact of Market Structure on Service Options for the Poor. In: Brook, Penelope J., Irwin, Timothy.C. (Eds). Infrastructure for Poor People: Public Policy for Private Provision. The World Bank, Washington DC, 2003

Abstract: Governments should consider a number of key pro-poor structural issues when planning to introduce private participation in network utility industries. Decisions made about these issues will, to a large extent, determine the impact of private participation on poor communities. Reforms aimed at assisting the poor must be considered explicitly before any major reform is actually carried out. They should begin with the collection of data to assess the specific conditions that affect the poor and their specific needs and preferences rather than relying on generalizations. Pro-poor issues should be considered as part of an integrated approach to structural reform. This will ensure that pro-poor structural reforms are compatible with overall approach; for example, they should result in regulation that focuses on networks access and is not too onerous for informal vendors and on a subsidy regime that is robust to the degree of entry and competition envisioned. In addition to reforms aimed at improving service and efficiency for all customers, the most important reforms specifically targeted to the poor are those that would allow small-scale informal vendors to provide service, even if they are directly competing with the dominant provider.

Keywords: *utility; poor; efficiency. 29 pages*

Energy Sector Management Assistance Programme

Energy Services for the World's Poor. Energy Sector Management Assistance Programme, Washington DC, USA, 2000

Abstract: Millions of households in the developing world still lack access to safe and reliable energy - and pay high prices for poor quality substitutes. Addressing their needs poses a major challenge for developing country governments and for all other players in the energy sector - private firms, financiers, regulators, nongovernmental organizations, and multilateral and donor agencies. This report serves as a resource in this effort, bringing together survey papers and case studies that reflect the views and experience of authors from wide-ranging backgrounds. It focuses on three broad themes: Understanding the challenge of expanding access to energy for low-income households and communities in developing countries; Facilitating technological and commercial innovations in serving the poor, through market structure and regulatory reform; Reducing financial, legal, regulatory, and tax barriers to better services for low-income households and areas. The report also reviews trends in private investment in the energy sector in 1990-99.

Keywords: *poor; household; developing country. 127 pages*

Energy Sector Management Assistance Programme

ESMAP Annual Report 2000-2001. Energy Sector Management Assistance Programme, Washington DC, 2001.

Abstract: ESMAP provides policy advice and other technical assistance to help governments, public institutions and private businesses. It focuses on three strategic areas: the development of energy markets, the promotion of environmentally sustainable energy production and uses, and the increased access to reliable, efficient and affordable energy

services by un-served or under-served populations. This book contains articles on: Making energy work for the poor; Products and services; Portfolio at a glance 2000-2001; Operational review; Impact of ESMAP activities and knowledge dissemination; The governance and management; and Financial review.

Keywords: *energy; international; ESMAP; poor; management; finance. 98 pages*

European Commission.

Energy as a Tool for Sustainable Development for African, Caribbean and Pacific Countries. European Commission, Brussels, Belgium, 1999

Abstract: Energy plays a critical role in sustainable human development. It impacts on poverty, population, health and environment, investment and agricultural development, foreign exchange and even security. It also has a strong gender implication. Policies aimed at providing energy services in a sustainable manner open doors to the achievement of a wide array of other development goals. This publication aims to intensify the global dialogue on sustainable energy issues and to provide a basis for future concrete cooperation activities.

Keywords: *international; Africa. 134 pages*

Food and Agriculture Organization.

Forests, Fuels and the Future, Report No. 5; FAO, 1995.

Abstract: This report describes a changing role for wood energy in a changing world where fuelwood and wood-based fuels need no longer be associated with poverty or underdevelopment but could rank among viable modern options open to energy users everywhere.

Keywords: *biomass; energy. 78 pages*

Foster, Vivien

Measuring the Impact Of Energy Reform-Practical Options. In: Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000.

Abstract: Government interventions in energy markets have many effects on the poor. But there has been little measurement of these effects on the poor, making it hard to know exactly what the effects of a project have been, and hard to compare those of different interventions. This could be rectified by building impact indicators into energy projects at the design phase-and doing so consistently and systematically, across countries and over time. This paper discusses the development of suitable indicators. First, agreement is needed on workable definitions of poverty and what would constitute welfare improvements for the poor. Then there must be explicit hypotheses on how specific elements of energy projects, individually or together, affect the poor. Finally, the indicators must be based on data that can realistically be collected in real-life low-income communities, in real-life developing countries.

Keywords: *Reform, poor, developing countries. 8 pages*

Foster, Vivien, Tre', Jean-Philippe

Measuring the Impact of Energy Interventions on the Poor-An Illustration from Guatemala. In: Brook, Penelope J., Irwin, Timothy.C. (Eds). Infrastructure for Poor People: Public Policy for Private Provision. The World Bank, Washington DC, 2003

Abstract: This chapter proposes a methodology for measuring the impact of interventions in the energy sector on the welfare of poor households. The aim of this methodology is not only make it easier to answer questions about how energy sector interventions have affected the poor, but also to help focus attention on poverty issues ex ante, thereby motivating the adoption of pro-poor features in the designing of interventions.

Keywords: *developing country; poor; households; poverty. 52pages*

Foster, Vivien

Public Policy for the Private Sector. The World Bank, Washington D.C, 2000.

Abstract: Government interventions in energy markets have many effects on the poor. But there has been little measurement of these effects, making it hard to know exactly what the effects of a project have been, and hard to compare those of different interventions. This could be rectified by building impact indicators into energy projects at the design phase - and doing so consistently and systematically, across countries and over time. This note discusses the development of suitable indicators. First, agreement is needed on workable definitions of poverty and what would constitute welfare improvements for the poor. Then there must be explicit hypotheses on how specific elements of energy projects, individually or together, affect the poor. Finally, the indicators must be based on data that can realistically be collected in real-life low-income communities, in real-life developing countries.

Keywords: *energy; international; poor. 11 pages*

Gelbach, J; Pritchett, L.

More for the Poor is Less for the Poor: The Politics of Targeting. World Bank, Washington D.C, 1999.

Abstract: Theoretical assessments of targeting generally have involved normative models in which one assumes the budget for redistribution is fixed, while the structure and the degree of targeting is chosen to maximize social welfare (or minimize poverty); alternatively, both the budget (i.e. degree of taxation) and targeting variables are chosen simultaneously. While the literature has considered information constraints, incentive compatibility, and efficiency losses, some degree of targeting is always found to be optimal in the models examined.

Keywords: *Poor; taxation; equilibrium. 26 pages.*

Halpern, Jonathan; Barnes, F. Douglas.

The Role of Energy Subsidies. World Bank, Washington D.C, 2000.

Abstract: A remarkable number of people in developing countries have gained access to electricity during the past twenty-five years-more than 1 billion. Still, about 2 billion people do not have access to electricity. Limited access, a high percentage of income spent on energy, and significant amounts of time spent collecting biomass fuel for cooking all have been cited as reasons for providing energy subsidies to encourage the poorest households

to use high-quality fuels. The problem is that while such subsidies can be beneficial, they can also be harmful, inefficient, and in some cases detrimental to the poor. This chapter explores the case for subsidies to promote the use of energy that enhances the quality of life of the poor or reduces their expenditures on energy and to encourage businesses to serve poor and rural populations.

Keywords: *Energy subsidies; efficiency; poor. 6 pages.*

Hawthorne, Wendy

Women and Large-Scale Electricity Development. The World Bank Working Paper 257, World Bank 1996.

Abstract: Many people believe that electricity development has been and continues to be beneficial to women. Early proponents of electrification of the United States, who included feminist visionaries, home economists, utility and transportation companies, and politicians, claimed that electrification would positively change the lives of women. While the vast majority of the United States is already electrified, many of the less developed countries (referred to collectively as the South in this paper) are not. Proponents of electrification of the South often use the same arguments that were used during the electrification of the United States. This paper shows that women in the United States have not significantly benefited from electrification. The arguments are then extended to women in the South, where the negative impacts of electrification are often more severe. It is argued that women in the South are far less likely than women in the United States to realize benefits from electrification, and that, since they often rely directly on the local environment for their family's subsistence, they will suffer from the negative effects of electrification far more severely and directly than have women in the United States.

Keywords: *Women, developed countries, electrification. 15 Pages*

Intermediate Technology Development Group

Sustainable Energy for Poverty Reduction: An Action Plan. Intermediate Technology Development Group, Warwickshire, 2002.

Abstract: This report reviews some international actions taking place to provide sustainable energy services to some of the world's poor. Three countries, China, Peru and Mozambique, have been analysed to demonstrate how they are addressing access to energy. Examples are given of implementing energy initiatives, which demonstrate the clear role that sustainable and renewable energy technologies have in fulfilling the energy needs of poor people in these countries.

Keywords: *energy; policy; poor. 65 pages*

Intermediate Technology Development Group

Power to the People: Sustainable Energy Solutions for the World's Poor. Intermediate Technology Development Group, Warwickshire, 2002.

Abstract: The World Summit on Sustainable Development offers a potential double win: reducing poverty without choking the planet. To achieve this there needs to be a global action plan to provide clean, sustainable energy to the world's poor. Some of the issues discussed in this newsletter are: Sustainable energy for cooking; Getting renewable electricity to the rural poor; Sustainable energy for the urban poor; Power to the people - a ten point agenda for change; The key challenges for energy planners and policy makers.

Keywords: *energy; developing country; poor; electricity; rural; urban; policy. 8 pages*

Izaguirre, Ada Karina

Private Participation in Energy. In: Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000.

Abstract: The past decade has seen a wave of liberalization and privatization of infrastructure activities in developing countries. By the end of the 1990s the private sector had become an improvement financier and long-term operator of infrastructure activities-in water, transport, energy, and telecommunications-in those economies. In 1990-98 it had undertaken the operating or construction (or both) of about 1,700 infrastructure projects in developing countries. Those projects involved investments of almost US\$500 billion. The availability of long-term foreign capital and the opening of infrastructure sectors to private investment allowed the rapid increase in private infrastructure activity in developing countries. Long-term foreign capital flows to developing countries such as foreign direct investment, foreign debt, or equity investment more than quadrupled between 1990 and 1997 before falling in the late 1990s as a result of the financial crises in developing economies (figure 1). This influx of foreign capital has made foreign investors the main sponsors of private infrastructure in developing countries. In 1990-98 global developers were the top fifteen sponsors, measured by investment, in the infrastructure business in developing countries and were involved in a tenth of the private infrastructure projects in a third of total investment in such projects.

Keywords: *Private investment, infrastructure. 10 pages.*

Karekezi, Stephen, Kimani, John

Common Approach Draft Paper for the Global Network on Energy: AFREPREN, Nairobi, 2003 for sustainable development, Energy Access study

Abstract: About 2.8 billion people or close to half the world population's is estimated to survive on less than US\$2.00 per day-the "poor" as defined by international agencies. A key distinguishing feature of the world's poor is inadequate access to cleaner energy services. The majority of those earning less than US\$2.00 per day rely on traditional biofuels to meet the bulk of their energy needs and have no access to electricity. This paper is the result of the discussion and debate at a 1-day coordination meeting of the GNEED working Group. It is the first draft of a proposed common approach that all Working Group Centres would adhere to in the preparation of their respective sub-regional studies. The primary purpose of this paper is to provide a common framework that would ensure some level of commonality among the various sub-regional papers and facilitate the extraction of common findings and recommendations that would be of some relevance in most developing countries.

Keywords: *reform; population; poor. 15 pages*

Kartha, Sivan; Leach, Gerald

Using Modern Bioenergy to Alleviate Rural Poverty. Paper presented at the Shell Foundation Modern Biomass Workshop, London, 2001.

Abstract: Biomass energy is remarkably heterogeneous. It encompasses industrial-scale plantations and hand-gathered weeds; long-distance trucking of charcoal chips and headloading firewood bundles; 30 MW gas turbines and 3-stone cooking fires. This paper cuts through this diversity by focusing on smaller-scale systems for providing modern energy

services to rural households, farms, and enterprises with the aim of increasing welfare and reducing poverty.

Keywords: *energy; biomass; international; rural; poor. 33 pages*

Kessides, Christine.

World Bank Experience with the Provision of Infrastructure Services for the Urban Poor. World Bank, Washington D.C, 1997.

Abstract: Urbanization is expanding rapidly in developing countries- within the next 25 years, more than half of their total populations will reside in urban areas. This growth will entail vast increases in the number of urban poor, who already number an estimated 400 million in the developing world and are expected to reach one billion by 2020. The urban poor not only have less access to infrastructure services than the nonpoor, but they also pay more heavily for informal sources of supply in both money and time. Since the World Bank has been lending for basic urban services for over two decades through a variety of modalities, it is worthwhile reflecting on this experience to draw out lessons for future efforts to address the growing needs.

Keywords: *Urban poor; infrastructure; Urbanization; developing countries.*

Komives, Kristin; Whittington, Dale; Wu, Xun

Energy Use Around the World-Evidence from Household Survey. In: Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000

Abstract: This paper presents findings from a study of data sets from Living Standards Measurement Study (LSMS) surveys in fifteen developing countries around the world. It reports results on electricity coverage, choice of cooking fuel, expenditures on electricity, and total energy expenditures. These results show: Cross-national differences. The countries in the sample are in Asia, Europe and Central Asia, Latin America and the Caribbean, and Sub-Saharan Africa, with surveys ranging from as recent as 1997 to as far back as 1988. The choice of countries in the study sample was based on data availability, differences in household energy use and spending between rich and poor and by consumption levels, differences between urban and rural areas, differences in coverage between electricity and other infrastructure services.

Keywords: *Energy services, household, developing countries. 12pages*

Komives, Kristin, Whittington, Dale, Wu Xun

Infrastructure Coverage and the Poor: A Global Perspective. In: Brook, Penelope J., Irwin, Timothy.C. (Eds). Infrastructure for Poor People: Public Policy for Private Provision. The World Bank, Washington DC, 2003

Abstract: This paper presents a global perspective on infrastructure coverage and the poor that many people will think they have seen before but have not. It is widely assumed that the poor in developing countries have fewer infrastructure services than middle- and upper-income households, but surprisingly little information is available on the actual empirical relationship between household income and infrastructure service coverage in different countries. The available coverage statistics are typically countrywide averages. This chapter introduces a new data source for global coverage statistics, the World Bank's Living Standards Measurement Study (LSMS) surveys, which address some, but not all, of these

limitations. These surveys on multiple logics gather extensive socioeconomic and expenditure information from households, as well as limited information on household's use of selected infrastructure services. The pooled sample includes more than 5,500 households in Asia, the Americas, Eastern Europe and Central Asia, and Sub-Saharan Africa. The LSMS surveys enable us to examine coverage for several infrastructure services among various income groups in many different countries using household-level data.

Keywords: *poor; developing country; income; household; Asia; Africa. 47 pages*

Leach, Gerald.

Energy and the Urban Poor. In: IDS Bulletin Vol.18 No.1. Institute of Development Studies, Brighton, 1987.

Abstract: For two main reasons, the urban poor of developing countries deserve much closer attention and concern than they normally receive from energy policies. The first reason stems from basic issues of welfare and distributional justice and the second one stems from their dependence on woodfuels. This article reviews a range of energy policies aimed at improving the welfare of the urban poor and reducing the pressures they exert on wood resources.

Keywords: *Income; policy; urban poor. 38 pages.*

Lovei, Laszlo; McKechnie, Alastair

The Costs of Corruption for the Poor. In: Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000.

Abstract: In recent years the fight against corruption has assumed a key place in development policy, as a way of strengthening economic growth and helping civil society and democracy to function. Corruption not only stifles growth. It also perpetuates or deepens inequality, as the few amass power and wealth at the expense of the many. The energy sector lends itself to corrupt practices. This is a result both of its traditional institutional arrangements-dominated by state monopolies controlling oil, gas, or electricity-and of the sheer amount of cash it can generate. Corruption in energy takes many forms, from petty corruption in meter reading and billing to grand corruption in the allocation of lucrative monopolies. These practices differ in scale but contribute to the same results-weak operational and financial performance and, for the poor in particular, declining service quality or reduced chances of ever accessing network services. The answer to corruption is continuing reform, to reduce the incentive and potential to capture monopoly rents and to increase the transparency of public and private transactions, regulatory structures, and decision-making process.

Keywords: *Corruption, poor, service, institutional structure. 8 pages*

Mills, Evans

Fuel for Lighting: An Expensive Commodity. In: Boiling Point No. 45. Intermediate Technology Group Ltd, Rugby, 2000.

Abstract: This article analyses fuel for lighting. Findings indicate that users of fuel based lighting in the developing world spend as much or more money on household lighting as do households in the industrialised world, but receive a poor level of service.

Keywords: Energy; economics. 2 pages

Nziramasa, N

Rural Electrification: A Challenge for Improving Access to Energy by the Poor.

Abstract: Access to energy can be defined in various ways. One of the most commonly used definitions is that access to electricity is the availability of electrical infrastructure in the rural areas. Efforts to increase access in rural areas seem to end at providing infrastructure for electrical energy delivery. The rural poor are therefore left without the means to use this energy, hence their access to useful energy is not significantly improved.

Keywords: income; energy; electricity; Africa; rural; poor; PV; environment; households. 8 pages

OECD/IEA

World Energy Outlook 2002; energy and poverty. Special Issue in the World Energy Outlook 2002. OECD/IEA, Paris, 2002.

Abstract: This study offers a unique look at the issue of energy and poverty. It focuses on electricity access and on traditional biomass use and provides an outlook over the next three decades. A key finding of this study is that 1.6 billion people do not have access to electricity today. In the absence of vigorous policies, 1.4 billion people will still lack access to electricity in thirty years time. Some 2.4 billion rely on traditional biomass to meet their cooking and heating needs.

Keywords: energy; poor; electricity; biomass. 47 pages

Pigott, Hugh

Windpower: Small is Beautiful. In: Boiling Point No. 45. Intermediate Technology Group Ltd, Rugby, 2000.

Abstract: Windpower has become an important renewable energy source in recent years. Large wind turbines are the fastest expanding sector of the Energy business in the industrialised world. Every year the wind turbines grow bigger, and the cost of wind-generated power grows smaller. But what about small wind turbines? They are more expensive in terms of each unit of energy that they can produce. But they have a role to play, especially for electrification of remote areas.

Keywords: energy; wind; RETs. 2 pages.

Powell, Stephen; Stalks, Mary

Key Drivers of Improved Access-Services Through Networks. In: Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000.

Abstract: Unless energy can be produced and delivered more cheaply, it will stay beyond the reach of many of the poor. For energy delivered through networks, the costs that matter are not only the unit energy costs, but the costs of extending the network-into an urban slum, for example, or to a rural town. Extending a network can be very expensive-a major barrier to access for poor households and small or isolated communities. A central goal of the reform of electricity and gas networks, now occurring in an increasing number of developed

and developing countries, is to provide incentives to reduce the costs of producing energy and getting it to consumers. New technologies in electricity are drastically reducing costs. But transmission costs are still a major hurdle to expanding networks in isolated or lightly populated areas. As a result it is the urban poor who stand the greatest chance of benefiting from network reform. For the rural poor, alternative solutions are required.

Keywords: *Access, poverty, developing country, technology. 8 pages*

Powell, Stephen; Starks, Mary

Public Policy for the Private Sector, Does Reform of Energy Sector Networks Improve Access for the Poor? The World Bank, Washington D.C., 2000.

Abstract: This note concentrates on the micro-economic effects: whether reform will make electricity cheaper for the poor who already have access to it, and provide it to those who do not. It analyzes the fundamental costs of generating electricity and distributing it through a grid to rural and poor populations. It describes how electricity reform and technological developments have reduced these costs in recent years and discusses institutional arrangements to ensure that lower costs are passed to customers. It examines whether reform will increase access to electricity for poor households and comments on policies to further the interests of the poor in the context of electricity reform.

Keywords: *energy; international; poor; electricity. 8 pages*

Prasad, Krishna

Electricity for the Urban Poor. In: Boiling Point No. 45. Intermediate Technology Group Ltd, Rugby, 2000.

Abstract: Though every urban area is electrified, some places such as the slum dwellings have no electricity. This article outlines the constraints involved in electrifying these areas and possible solutions to them. It tries to suggest an approach to providing electricity to the urban poor. Normal method of providing electricity is a non-starter for this group. The best way, to do this is to simply integrate the people in the electrification process.

Keywords: *India; electricity; energy; poor. 2 pages.*

Price, Catherine W.

Better Energy Services, Better Energy Sectors-and Links with the Poor. World Bank, Washington D.C, 2000.

Abstract: Energy policies have a key role in the development and growth strategies of governments. Ready access to reliable, reasonably priced energy-particularly by industry, agriculture and the commercial sector-is an important catalyst for growth. In general, there is a broad agreement, supported by a degree of anecdotal evidence, on the direction of links between energy and poverty alleviation. This chapter is restricted to discussing broad directions, rather than precise measures of impact.

Keywords: *Reforms; poor. 6 pages.*

Price, Catherine Waddams

Better Energy Services, Sectors-And Links With The Poor. In: Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000.

Abstract: Governments around the world see energy projects and policies as key parts of their strategies for growth and development. Traditionally, governments have relied heavily on direct investment of public funds-through public providers-to expand energy capacity and access. More recently, a growing number have refocused their energy policies, opening the sector to new players and looking to the private sector to finance improvements in services. How do these interventions affect the poor? What are the links between better access to energy services-and better services-for households and communities and household welfare? What does more to improve the welfare of the poorest-growth-oriented sectoral policies or access-oriented policies? And what does the shift in focus from public investment to reform mean for the poor? Knowing the answers to these questions is critical for governments wanting to ensure that their sectoral interventions at least cause no harm to the poor and, more optimistically, can systematically improve their welfare. Current answers to these questions rest on a mix of economic reasoning and rich anecdotal evidence. But hard to support rigorous answers in short supply-a major challenge for the sector.

Keywords: *Poverty, policy, public investment. 8pages.*

Reddy, Amulya.

Energy Technologies and Policies for Rural Development. Economic and Political Weekly, Laxenburg, 1999.

Abstract: If the goal to be achieved by any energy system is sustainable development, then the goal for rural energy systems, therefore, must advance rural economic growth that is economically efficient, need-oriented and equitable, self-reliant and empowering, and environmentally sound. The stress on equity means that rural energy systems must first and foremost promote poverty alleviation and improved living conditions for the poor, as measured by the Human Development Index, HDI. The HDI measures a country's achievements in three aspects of human development: longevity, knowledge, and decent standard of living. Improving these aspects of human development, and therefore the HDI, has three crucial dimensions: equity based on a marked increase in access of poor to energy services, empowerment based on strengthened endogenous self-reliance and environmental soundness. Thus for an energy system to be in the interest of the rural poor, it must: increase their access to affordable, reliable, safe, and high-quality energy; strengthen their self-reliance and empower them; improve the quality of their environment-starting with immediate environment in their households

Keywords: *energy; international; household; rural; economic; environment; poor. 17 pages*

Reddy, Amulya K. N.

Energy and Social Issues. United Nations Development Programme, New York, 1999

Abstract: Human society cannot survive without a continuous use of energy. Modern economies are energy dependent. In the supply driven approach, the appetite for energy often exceed the capacity of local sources of supply.

Keywords: *rural; urban; transport. 61 pages*

Reddy, Amulya K.N.; Williams, Robert H.; Johansson, Thomas B.
Energy After Rio: Prospects and Challenges - Executive Summary. United Nations Development Programme, New York, USA, 1997

Abstract: A brief summary of the prospects and challenges of the energy scenario after the Rio summit held in 1992 are presented in this book. It examines energy versus social issues which include gender disparities, poverty, population and nutrition. It also discusses the effects of energy on the environment, health and land and also on the climate change. It also reviews the new opportunities in energy demand, supply and systems, sustainable strategies and energy for sustainable development.

Keywords: *climate change; rural; urban; nuclear. 34 pages*

Reiche, Kilian; Covarrubias, Alvaro; Martinot, Eric
Expanding Electricity Access To Remote Areas: Off-Grid Rural Electrification In Developing Countries. Published In: Worldpower 2000, Guy Isherwood, Ed. Isherwood Production Ltd., London 2000.

Abstract: The Challenge of Rural Energy and Development: The World Bank Group's mission is to work towards a world without poverty. An important part of this mission is expanding access to modern energy services for an estimated two billion people who still lack such services (World Bank 1996, ESMAP 2000c). Expanded access to energy services is inexorably linked to today's transforming energy sector. Although ongoing reforms are showing success and being replicated, there is growing concern about their social and environmental sustainability. In developing countries, the concern is twofold: how to derive the most benefit from a liberalised and unbundled energy sector while ensuring environmental sustainability and improving access for the poor. Lack of access to energy in rural areas is of same order of magnitude as lack of access to other types of infrastructure. In fact, it is often the same rural or urban poor who lack access to modern energy services, electricity, modern telecommunications, clean water and other basic services. This interdependency is obviously part of the problem (high service costs versus low ability to pay due to low income), but may also be part of future solutions: the potential of bundling services on a local demand side basis is just recently being (re)discovered for development.

Keywords: *Access, rural, off-grid, electrification, developing countries. 8 pages*

Remenyi, Joe
Where Credit Is Due - Income Generating Programmes For The Poor In Developing Countries. Intermediate Technology Publications, London, 1993.

Abstract: This study of the economics of survival reveals a world of commerce in poor countries which challenges our conventional image of the 'poverty trap' and those caught in it. The investment and loan record of many thousands of able but poor 'microentrepreneurs' reveals that the poor are able to save, do have investment opportunities, are trustworthy, are well motivated and do help themselves to overcome poverty - when they are given the opportunity. The poor do want right and fair dealings, access to resources and freedom to pursue their own way; they do not want or need charity.

Keywords: *poor; developing country; urban; rural. 156 Pages*

Saupin, Marc

World Bank – GEF Funding For Renewable Energy Projects. Presented in the Seminar on: Women Leaders on the Uptake of Renewable Energy, Perth, 2001
(<http://acre.murdoch.edu.au/unep/papers/Saupin.pdf>)

Abstract: This paper analyses the World Bank funding of renewable energy projects. The momentum behind renewable energy applications is gathering pace around the world. With markets poorly developed and hence, investment returns vague, there is little interest from the private sector. These factors underpin some of the reasons why bilateral and multilateral donor organization intervention is needed. Events in the recent past have created several important institutional developments around the World for renewable energy funding. Where grid extension is cost prohibitive, decentralized systems using conventional diesel in combination with hybrid renewable energy inputs from solar and wind, for example are proving cost-effective. With the environmental benefits of reduced carbon emissions coupled with a growing recognition that energy is fundamental to rural development, renewables are slowly becoming the choice of rural development planners. Nonetheless, in spite of their qualities, the up-front capital costs associated with renewable energy projects are high and in countries where they are most needed, government budgets are constrained. The programmatic approach by these organizations as opposed to the outdated project approach underscores the desire for wider-scale sustainable outcomes while recognizing the multi-access nature of sustainable development. Barrier identification and removal are key activities. According to the author, the key to project success lies in being able to effectively link project inputs and outputs with national plans and priorities for sustainable development. It is also necessary to build or strengthen the institutional framework for renewables in the host country and to ensure the regulatory and legal frameworks support the process. Involvement of multi sectoral interests including the private sector and most importantly adopting an end-user approach with strong involvement of grass roots organizations helps to ensure that comprehensive measures are being taken. So to achieve sustainable outcomes, the support from all levels of government, wider stakeholder community and strong community participation are fundamental.

Keywords: RETs, GEF, women. 20pages

Schubert, Philip. P. Eng.

Overcoming the Limits of the Market Place in Achieving Universal Access to Electricity. Canada, 2003.

Abstract: Universal access to electricity was achieved in North America, Europe and parts of Asia nearly 50 or more years ago. However, there are nearly 2 billion people in developing countries who still do not have access to electricity. A key priority for developed countries in their aid programs is to assist developing countries in meeting this challenge. The Canadian International Development Agency (CIDA), which is responsible for Canada's aid programs to developing countries, did a study a few years ago to try and understand how today's developed countries did in fact achieve universal access, looking in particular at Canada's experiences. The results were surprising. Firstly, it was possible to demonstrate that in the case of Canada, when the process began in the 1920's that finally resulted in universal access, the country's economic circumstances were comparable to many of today's developing countries. It was also learned that electrification in Canada had stopped years before 1920 when market equilibrium had been achieved, in effect market penetration stopping at about 50% access, the other 50% of the population not being able to afford electricity. The country was caught in a "catch 22" situation. On one hand 50% of the population could not afford electricity and on the other hand the country was too poor to do anything about it. In fact, most of the countries around the world arrived at this state of equilibrium at about the same time. Thus why and how this issue was addressed and

resolved in some countries, thus transforming themselves, it can be argued, into developed countries through providing this and other basic services to all of its population? Finally, what lessons can be learned from this that might still be relevant to today's developing countries? The paper presents the results of CIDA's research into this vital issue.

Keywords: *electrification; Canada; poor; developing countries. 7 pages.*

Silveira, S (Ed)

Renewable Energy for Development, Vol. 8 No. 4. Stockholm Environment Institute, Stockholm, 1995.

Abstract: This issue includes the following articles: "A Tax for Renewables?", "Women's Empowerment in South Africa", "Technology Transfer Overlooked in GEF Solar Project", "From Candles to Electric Light: Can Poor People Afford Solar Electricity?" as well as a summary of new publications.

Keywords: *international; women; solar; electricity; appropriate technology; newsletter; poor. 8 pages*

Smith, Warrick

Regulating Infrastructure for the Poor: Perspectives in Regulatory Systems Design. In: Brook, Penelope J., Irwin, Timothy.C. (Eds). Infrastructure for Poor People: Public Policy for Private Provision. The World Bank, Washington DC, 2003

Abstract: Governments around the world are transforming infrastructure sectors to better meet the needs of their people. Regulatory reform is an essential part of this process, and consensus is growing around the key principles that should shape the design of regulatory systems for infrastructure in the industrial countries. To date, however, much less attention has been given to how well the same principles meet the needs of the world's poorest citizens. This chapter explores the question in three parts. It begins by considering the design of regulatory systems for infrastructure and outlines three broad principles that reflect contemporary notions of best practice in the industrial countries. It then outlines the special challenges associated with regulating to meet the needs of the world's poorest people and assesses the implications for the principles derived from industrial country experience. It concludes by outlining the key challenges associated with implementing a pro-poor strategy.

Keywords: *poor; regulatory. 24 pages*

Subbarao, K; Braithwaite, J; Jyotsna, Jalan.

Protecting The Poor During Adjustment And Transitions. World Bank, Washington D.C, 1995.

Abstract: This paper reviews the programs implemented in selected countries to protect the poor during normal times and during transition or adjustment. In particular, two questions are addressed: how have countries implemented the programs in practice, and what are the lessons. The paper reviews five sets of programs: Firstly, food subsidies and related interventions, secondly, food for works and other public work programs, thirdly, credit-based self-employment programs, fourthly, social funds and related interventions, and lastly, child allowances. More representative than comprehensive, the selection of programs and countries is based on the availability of rigorous evaluations, the importance of the program, and the issue under consideration. In choosing between the instruments and their duration and coverage, governments face key issues, including how much to spend and how to

finance programs; how to target assistance to the poor, within politically feasible limits; how to select the most appropriate delivery mechanism; and how to avoid adverse effects on incentives for labor supply and private savings and transfers.

Keywords: *Poor; social security; reforms. 24 pages.*

The World Bank

The World Bank Group's Energy Program: Poverty Reduction, Sustainability and Selectivity. The World Bank, Washington DC, USA, 2002.

Abstract: Efficient and the clean energy supply is central to the reduction of poverty through many and varied linkages, as well as being important for economic growth. Yet many developing and transition economies suffer from poor energy services. These countries must overcome major challenges in improving the performance (social, economic, financial, institutional, and environmental) of their energy suppliers. Energy production also plays a key part in economies. Efficient production of primary energy, particularly oil and gas, is important for fiscal stability and balance of payments, and domestic coal is important in many countries for energy security. Oil exports are the main source of export earnings and fiscal revenues in many developing and transition economies, providing enormous potential for economic and social development. But many of these countries have squandered this potential, falling behind non-oil-producing developing countries in economic growth and other development indicators. These countries urgently need to improve governance in the energy sector.

Keywords: *Poverty; developing country; policy; rural; regulatory; 23 pages*

Townsend, Alan

Energy Access, Energy Demand, and the Information Deficit: In Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000

Abstract: Projects and policies that improve the poor's access to reliable, modern energy services can make an important difference to their welfare. But what is the starting point for improving access? And what kinds of improvements will poor households and communities value? To answer these questions requires some understanding of how they obtain and use energy services today, both for consumption and for productive activities. Also essential is an understanding of poor households' demand for better energy services-and their willingness to pay for them. Traditionally, data collection on these issues was weak-state monopoly providers had limited incentives and capacity to learn about their current and potential customers. More recently, policy advisers and donor agencies have worked to understand the poor's demand for services and to tailor projects to their preferences. But the data gap remains wide. A commonly cited figure for those lacking access to electricity is 2 billion people. As this chapter and its annex show, these people rely on highly varied energy sources-often incurring real costs far higher than those for equivalent energy from electricity networks. Improving energy services is not, of course, simply a matter of reaching 100 percent electrification. It means providing better options for moving to cleaner, safer, cheaper energy sources-and making energy markets more responsive to the needs and demands of households and communities. Evidence suggests that the poor are indeed often willing to pay for better energy services. Thus a major challenge is to open markets to identify and meet this demand.

Keywords: *Poor, access, energy services. 6 pages.*

**United Nations Centre For Human Settlements
Energy For Low-Income Settlements. United Nations Centre For Human Settlements,
Nairobi, 1991.**

Abstract: The United Nations Centre for Human Settlements (Habitat) has been making an unremitting effort aimed at alleviating the fuel crisis of the rural and urban poor. The publication is a continuation of that effort. Various studies, carried out over the years, have analysed the ways in which fuel scarcity for the poor is widening and deepening. They all tend to show that there are three types of possible solutions: increased biomass production, improved conversion efficiency and substitution by other fuels ie switching. The three types of possible solutions are examined in detail in this publication. In addition to reducing fuel scarcity, these solutions could provide increased opportunities for setting up rural industries, which would generate income and help in poverty alleviation. It is hoped that the publication will be useful to policy makers as well as officers and organizations involved in finding solutions to the energy problems of the poor and to the growing environment questions posed by the existing energy patterns.

Keywords: *energy; poor; policy; Asia; Africa; household. 5 pages*

**United Nations Development Programme
UNDP and Energy for Sustainable Development. United Nations Development
Programme, New York, 2002.**

Abstract: This book reports on the United Nations Development Programme (UNDP)'s approach to energy; UNDP's sustainable energy programme; Promoting rural energy services to support growth and equity; Promoting clean energy technology for sustainable development; Increasing access to investment financing for sustainable energy; Advocacy, analysis and knowledge networking; and, Partnership for modern biomass-based energy development in China.

Keywords: *energy; international; Africa; poor. 14 pages*

**United Nations Environment Programme
Reforming Energy Subsidies: An Explanatory Summary of the Issues and Challenges
in Removing or Modifying Subsidies on Energy that Undermine the Pursuit of
Sustainable Development. United Nations Environment Programme, Nairobi, Kenya,
2002**

Abstract: Subsidies on the supply and use of energy have emerged as a major theme in international discussions and negotiations aimed at promoting sustainable development. Energy subsidies matter, both because they are big and because they affect in wide-ranging and diverse ways the economy, social welfare and the environment-the three dimensions of sustainability. Reforming energy subsidies must, therefore, be a central plank of government efforts to promote energy systems that strike a better balance between these three dimensions. Subsidies that encourage the production and use of fossil fuels are usually bad for the environment. They can also be costly and often bring few benefits to the people for whom they are intended. But subsidies may make sense in some cases. Examples include temporary support for new renewable and energy-efficient technologies to overcome market barriers, and measures to improve poor or rural household's access to modern, commercial forms of energy. The way in which specific programmes are designed is crucial to their effectiveness. This booklet draws on recent work on energy-subsidy carried out by United Nations Environment Programme (UNEP) and the International Energy Agency (IEA). It summarizes in non-technical language the central issues related to energy

subsidies and key messages for policy makers looking to reform subsidy programmes.

Keywords: *subsidy; Reforms; rural; household; poor; policy. 31 pages*

Van de Walle, Dominique.

Public Spending and the Poor: What We Know, What We Need to Know.
World Bank, Washington D.C, 1995.

Abstract: Public spending aims to promote efficiency (by correcting for various market failures) and equity (by improving the distribution of economic welfare). This paper, drawn from a book on public spending and the poor, is concerned with the latter. In it Van de Walle focuses on three key questions: What is the welfare objective? How are the benefits of public spending currently distributed? How can that distribution be improved?

Keywords: *Poverty; policy. 2 pages.*

Villagran, Eduardo

Key Drivers of Improved Access-Off-Grid Service: In Energy Services for the World's Poor, ESMAP Energy and Development Report 2000, The World Bank, Washington DC, 2000

Abstract: For the foreseeable future the prospects of better energy services for many of the poor will depend not on the wholesale expansion of electricity and gas networks, but on finding better, cheaper off-grid energy sources. In rural areas and city slums ways must be found to bring down the costs of cleaner, more reliable fuels and the costs of doing business in supplying and serving poor communities. Poor communities and households need help in making informed choices between energy services and may have to take collective action to secure them. Financing hurdles for consumers on the margins of the cash economy must also be overcome. Both technological and commercial innovations are needed to bring down the costs of producing energy and of financing and managing services. While there are many promising developments, the costs of implementing innovative off-grid projects remain high, and the challenges of scaling up are daunting. Second, the use of subsidies must be improved in ways that encourage innovation.

Keywords: *Electricity, off-grid, technology, poor. 8 pages.*

Wilkinson, Rona

Low Cost Electrification: The Need for Access to Energy Services. In: Boiling Point No. 45. Intermediate Technology Group Ltd, Rugby, 2000.

Abstract: Rural areas in developing countries have limited access to all types of services among them, the provision of energy services. This article argues for a grid or through decentralised schemes to supply electricity to rural areas. The article highlights the need for access to energy services in the developing world by giving an example of how decentralised electrification is carried out in the western world.

Keywords: *energy; Africa; rural; electricity. 1 page.*

World Energy Council.

The Challenge of Rural Energy Poverty in Developing Countries. World Energy Council, City 1999

Abstract: This report presents a broad survey of the energy problems of developing countries. It draws on regional reports and many other reports on the subject area. The first annex is a specialist study of one of the most important energy sources in developing countries – woodfuels. The second annex is a series of case studies from individual WEC countries, which illustrate and illuminate the findings in the main report.

Keywords: *wind; RETS; developing country; rural; biomass; solar; electricity. 185 pages*

World Bank

2003 African Development Indicators. World Bank, Washington D.C USA, 2003

Abstract: This volume presents the available relevant data for 1980-2000, grouped into fourteen chapters: background data; national accounts; price and exchange rates; money and banking; external sector; external debt and related flows; government finance; agriculture; power, communications, and transportation; public enterprises; labor force and employment; aid flows; social indicators. Each chapter begins with a brief introduction on the nature of the data, followed by a set of charts, statistical tables, and technical notes. These define the indicators and identify specific sources.

Keywords: *statistics; international; poverty. 410 pages*

World Bank

2003 World Development Indicators. World Bank, Washington D.C USA, 2003

Abstract: The World Development Indicators present a statistical snapshot of the world as seen by development economists. As the understanding of the development process has grown, so has the World Development Indicators. It now encompasses more than 500 indicators covering 152 countries, selected from a database spanning 40 years with more than 800 indicators for 208 countries. It provides a larger picture of poverty trends and social welfare, thus the use of environmental resources, the performance of the public sector, and the integration of the global economy.

Keywords: *statistics; international; poverty. 391 pages*

World Bank.

Energy Services for the World's Poor. World Bank, Washington D. C, 2000.

Abstract: How should a developing country government, concerned with tackling poverty among citizens, think about its role in the energy sector? Do energy policies and projects have a positive role to play in alleviating poverty? If they do, what kinds of policies and projects are likely to have the most beneficial-and sustainable-impact? This paper seeks to cast light-and provoke debate-on the questions that must be answered to develop energy sector policies that play a positive and sustainable role in the battle against poverty.

Keywords: *Poor; energy. 52 pages.*

**World Bank.
Rural Energy and Development for Two Billion People.
World Bank, Washington D.C, 1996.**

Abstract: It is hard not to be daunted by the scale of the problem of providing modern energy service to the world's rural population. There are nearly two billion people without access to modern forms of energy, such as electricity and oil. This brochure describes the plight of these two billion and summarizes the many ways in which their situation can be improved. Though the problem is daunting, practical and affordable prescriptions are now available.

Keywords: *Rural; development; infrastructure. 15 pages.*

**World Bank
Rural Energy and Development: Improving Energy Supplies for 2 Billion People.
World Bank, Washington D.C. USA, 1996**

Abstract: This paper envisages a renewed commitment by the World Bank to support its member countries' efforts to extend modern energy supplies to populations still without them and to promote the sustainable supply and use of biofuels for as long as they remain important sources of energy. Modern energy is defined to include new forms of renewable energy.

Keywords: *energy; international. 103 pages*

**World Bank
World Development Report 2000/2001: Attacking Poverty. World Bank, Washington DC, USA, 2001**

Abstract: This report covers the nature and evolution of poverty, causes of poverty and a framework for action, growth, inequality and poverty, making markets work better for poor people, expanding poor people's assets and tackling inequalities, empowerment, security and international actions.

Keywords: *statistics; international; poverty. 335 pages*