ENERGY AND POVERTY IN THE MALDIVES

Challenges and the Way Forward

Regional Energy Programme for Poverty Reduction
UNDP Regional Centre in Bangkok
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More than a billion people in the Asia-Pacific region do not have access to electricity and 1.7 billion are dependent on traditional biomass fuels for their cooking and heating needs. Access to affordable modern energy services can improve their productivity and enhance living standards.

Even so, there are no specific targets for the energy sector in the Millennium Declaration, a historic document signed seven years ago by the world’s leaders. Affordable and sustainable modern energy services are a necessity for countries to meet their Millennium Development Goals (MDGs). Efforts of countries in the Asia-Pacific region to meet these aims will be hindered unless adequate attention is given to the crucial role energy services play in the development process. This is particularly true for the economic, environmental and social well-being of the poor.

With fluctuating energy prices, the poor in many of the countries in the Asia and Pacific region face a daunting future. For them, access to affordable and essential modern energy services that could improve their living conditions and ensure a means to earn a living, will fall outside their reach.

Recognizing the urgency for countries to factor in access to modern energy services, particularly when shaping national poverty reduction initiatives, the United Nations Development Programme (UNDP) provided technical and financial support for national-level rapid energy assessments. The primary aim of this work, carried out through UNDP’s Regional Energy Programme for Poverty Reduction (REP-PoR) and completed in 2006, was to identify gaps and priority needs in linking energy services provision with poverty reduction.

The framework for rapid gap assessments linking energy and poverty was developed as a joint effort of the UNDP Regional Centre in Bangkok (RCB) and UNDP country offices in the region, with the support of experts from the region. The draft framework was discussed at two sub-regional meetings, one held in Bangkok, Thailand (August 2005) and the other in Apia, Samoa (September 2005). The meetings were helpful in customizing the framework to suit specific needs and circumstances of the participating countries.

Subsequently, UNDP country offices held national-level stakeholder consultations to consolidate the findings and recommendations of the assessments. This work benefited immensely from the support of government
officials and representatives of civil society. Documented in individual country reports, this work serves as resource and reference material for programming and planning for access to modern energy services for the underserved, particularly, the poor.

This document is a summary of the Country Report on the Maldives and is part of a series of REP-PoR’s Asia-Pacific publications. It draws on the key findings of the Country Report, summarizes the challenges faced at the national level, and provides priority recommendations. Specifically, critical issues related to energy policy, including institutional structures, regulatory frameworks, priority programmes, financing measures, gender concerns, as well as monitoring and evaluation support are highlighted. It offers a way forward, outlining issues and options for the country.

Our hope is that this document will be of relevance to national policy makers, development partners, energy service providers, civil society organizations and academia in implementing various measures to promote access to modern energy services for the poor.

Marcia V.J. Kran
Head of Policy and Programmes
UNDP Regional Centre in Bangkok
This report sets out to examine the ways and means to providing affordable, accessible and reliable energy services in support of achievement of the Millennium Development Goals (MDGs) and poverty reduction in the Maldives. The underlying premise of this study is that access to affordable and sustainable sources of energy has strong links to poverty reduction. This is particularly the case in terms of energy and its effects on household income, health, education, gender and the environment. The report also offers options for the country to overcome its energy sector challenges.

This study is especially valid in the context of the Maldives, where income disparities are rising between the urban and outer islands and atolls, and dependency on energy imports is heavy, especially for the electricity and transport sectors. Diesel accounts for more than 80 percent of total primary energy demand and almost all electricity generation. It is then not surprising that imbalances in access to modern energy services also exist. Twenty-four hour electricity is not common on all inhabited islands. Many outer island households still greatly depend on biomass, including fuelwood, for cooking energy. Yet due to depleting biomass resources and restrictions on its use, they are increasingly switching to kerosene and liquefied petroleum gas. Cost of electricity and modern fuels, quality of services and supply constraints, however, are burdensome on poor households, especially on remote islands and atolls. In addition, the geographic vulnerability of the low lying country of small islands was truly exposed during the 2004 tsunami. The Government of Maldives has also identified vulnerability to climate change and sea level rise as a serious concern to the future of the nation.

This study examines critical energy issues in the Maldives, including the institutional structure of the energy sector, policy and regulatory framework, and sectoral programmes. It analyses reasons for the limited reach of energy services to rural provinces; unsustainable dependence on traditional fuels and inefficient technologies; the restricted supply of energy by rural energy enterprises; and inadequate financing for energy. Gender concerns are examined in rural energy projects and programmes. It highlights the urgent need for key data and indicators to support monitoring and evaluation of energy access for areas that are least served.
This report concludes that the lack of coordination and limited capacities spanning the entire energy sector in the Maldives are major constraints to the creation of a comprehensive pro-poor energy strategy. Public-private partnerships, in addition to other capacity-building interventions can improve energy delivery, promote decentralized economic development and encourage development of cost-effective renewable energy solutions in the Maldives. Private entrepreneurs and Island Development Committees with experiences in modern energy and improved technical capacities can be better suited for developing renewable and non-renewable energy systems on the islands, especially on isolated small islands where demand for energy services is limited. Improved capacities of the government entities can enable strategy formulation that promotes the provision of energy access to the poor. Policies that enable fair market competition with existing monopolies should be formulated and implemented, and incentives should be developed for the private sector to venture into the energy provision business in the rural areas.

Promising energy initiatives can and do exist in the Maldives. For instance, the Renewable Energy Technology Development and Application Project (RETDAP) seeks to enhance capacities for renewable energy technologies and related income generation at the island level. RETDAP has succeeded in addressing several gaps in energy access, but sustained resource mobilization to set up capital-intensive physical infrastructure for renewable energy projects is needed. Also, conducting renewable energy resource surveys in selected areas and assessing technical requirements is important in the long run. Equally important are continued efforts to increase the awareness of renewable energy, its applications, potential, and success stories, and to promote energy-based entrepreneurship, which can be supported by feasibility studies and energy data. The Information Exchange Service that was set up under the RETDAP could be replicated elsewhere and expanded from just including renewable energy information to covering the entire energy sector, particularly the electricity sub-sector.

The study recommends that a national level coordination mechanism be developed that oversees decentralized energy programmes with livelihood components and island-level, pro-poor energy initiatives. Several assessments of capacity-building needs that reach independent power producers and even the most rural communities can
be conducted. Such initiatives could also build on the experience of RETDAP or other similar efforts. There are several lessons that can be learned from this type of project, and they can serve the upscaling of this potentially successful initiative. The efforts could also be expanded through partnering with existing livelihood programmes to enhance resource mobilization, and through widening the coverage of RETDAP to include productive use of renewable energy projects in other outer islands. Stringent funding conditions for renewable energy projects and financial capacities of entrepreneurs and energy consumers in rural communities need to be assessed and addressed.

The continued policy focus of the Maldives National Development Plans on encouraging public-private partnerships is highly commendable. The institutional re-structuring of the energy sector is already proving beneficial to some extent in terms of improvements in coordination and regulatory frameworks. The establishment of MEEW and MEA, and formulation of the draft Sustainable Energy Plan of 2004 and the draft National Energy Policy (NEP) of 2005 are important steps toward a strengthened framework for the energy sector. The Government of Maldives aims to expand the share of renewable energy in total energy generation to 12 percent by 2015. These government-supported activities must be complemented, however, with equally strong efforts towards the goal of improved energy access for poverty reduction as a way to correct socio-economic imbalances. Thus, consideration must be given to current policies and regulations on energy generation and imports, as well as to an implementation plan for the NEP. Equally important is providing poor households with access to alternative sources of affordable modern fuels and efficient energy technology. Well-targeted pro-poor subsidy and tax policies are therefore imperative. Such policies can have a major impact on the capital costs for rural grid electrification and the development of off-grid solutions – such as improved cooking stoves, biomass gasifiers and other such technologies. These must be complemented by a reform of electricity tariffs directed at poor households, and increased and improved schemes for the provision of micro-finance for micro-scale enterprises and different income-generating activities.

We trust that the report is unique in terms of its insights into the current functioning of the energy sector and into the options that bridge the gaps between access to energy and poverty reduction in the Maldives.
Our aim is to provide country specific information on institutional structures, energy resources, policy recommendations, and capacity and financial gaps that can point the way towards improving access to modern energy services, particularly for the poor.

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Regional Energy Programme for Poverty Reduction
UNDP Regional Centre in Bangkok

Energy and Poverty in the Maldives
ACKNOWLEDGEMENTS

Energy and Poverty in the Maldives: Challenges and the Way Forward is the result of a partnership initiative of the United Nations Development Programme (UNDP) Asia-Pacific Regional Energy Programme for Poverty Reduction (REP-PoR). It benefits from collaboration between the UNDP Regional Centre in Bangkok (RCB), UNDP-Maldives Country Office, key national stakeholders and regional experts.

This report is the seventh in the series of nine country reports for Asia and a synthesis report on similar lines for the Pacific Island countries. Like any multi-stakeholder work, this report reflects the efforts of many people over the last two years. We would like to express our appreciation for the inputs, suggestions and support provided by them.

Our appreciation goes to the strong support of the Energy and Environment Team of UNDP-Maldives in the entire process of the gap assessment and the preparation of the original Country Report. Hudha Ahmed, the UNDP Country Office focal point in the Maldives, and Batjargal Elbegzaya, the then Country Office focal point, and Kari Blindheim, Deputy Country Resident Representative, in their respective capacities, provided strong support through many rounds of review and comments, in addition to providing critical data and information to complete the original Country Report. We would also like to acknowledge Ganesh Ram Shrestha, the international expert, and Mohamed Rasheed, the national expert, who were responsible for preparing the original Country Report and going the extra mile in capturing, consolidating and processing all the inputs gathered from an elaborate country consultative process. Ibrahim Hafeezur Rehman provided overall technical backstopping and guidance in the preparation of the original report to the country team.

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The analytical structure and conceptualization of the gap assessment report went through many rounds of reviews and revisions by the core REP-PoR team in RCB, namely Nandita Mongia, Thiyagarajan Velumail, Thomas Jensen and Bhava Dhungana during the last two years. The final production of this abridged version owes much to the contributions of Manuel Soriano, Usha Rao and Sanna Salmela-Eckstein. We appreciate the inputs from Abu Sadat Moniruzzam Khan and Sooksiiri Chamsuk who contributed at different stages of finalizing the Country Report.

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ACRONYMS/ABBREVIATIONS

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<td>ADB</td>
<td>Asian Development Bank</td>
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<td>ADC</td>
<td>Atoll Development Committee</td>
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<td>ADF</td>
<td>Atoll Development Fund</td>
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<td>EAC</td>
<td>Energy Advisory Committee</td>
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<td>EE</td>
<td>energy efficient</td>
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<td>EMRS</td>
<td>energy monitoring and reporting system</td>
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<td>ESCO</td>
<td>energy service company</td>
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<td>FRESA</td>
<td>Fund for Renewable Energy System Application</td>
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<td>GDP</td>
<td>gross domestic product</td>
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<td>GEF</td>
<td>Global Environment Facility</td>
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<td>HDI</td>
<td>Human Development Index</td>
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<td>IDC</td>
<td>Island Development Committee</td>
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<td>IPP</td>
<td>independent power producer</td>
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<td>kWh</td>
<td>kilowatt-hour</td>
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<td>LPG</td>
<td>liquefied petroleum gas</td>
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<td>M&amp;E</td>
<td>monitoring and evaluation</td>
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<td>MAA</td>
<td>Ministry of Atoll Administration</td>
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<td>MCST</td>
<td>Ministry of Communication, Science and Technology</td>
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<td>MDGs</td>
<td>Millennium Development Goals</td>
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<td>MEA</td>
<td>Maldives Energy Authority</td>
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<td>MEB</td>
<td>Maldives Electricity Bureau</td>
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<td>MEEW</td>
<td>Ministry of Energy, Environment and Water</td>
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<td>MOAD</td>
<td>Ministry of Atolls Development</td>
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<td>MFT</td>
<td>Ministry of Finance and Treasury</td>
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<td>MPND</td>
<td>Ministry of Planning and National Development</td>
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<td>MT</td>
<td>Ministry of Tourism</td>
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<td>MW</td>
<td>Megawatt</td>
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<td>NDP</td>
<td>National Development Plan</td>
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<td>NEP</td>
<td>National Energy Policy</td>
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<td>NGO</td>
<td>non-governmental organization</td>
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<td>OPVI</td>
<td>Oil Price Vulnerability Index</td>
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<td>R&amp;D</td>
<td>research and development</td>
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<tr>
<td>REAP</td>
<td>Renewable Energy Action Plan</td>
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<td>REF</td>
<td>Revolving Electricity Fund</td>
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<td>REP</td>
<td>Renewable Energy Portfolio</td>
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<td>RET</td>
<td>renewable energy technology</td>
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RETDAP  Renewable Energy Technology Development and Application Project
SEP    Sustainable Energy Plan
SME    small and medium enterprise
STELCO State Electric Company
STO    State Trading Organization
toe    tonnes of oil equivalent
UNDP   United Nations Development Programme
UNESCAP United Nations Economic and Social Commission for Asia and the Pacific
UNOPS  United Nations Office for Project Services
USAID  United States Agency for International Development
WDC    Women Development Committee
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Maldives, located in the Indian Ocean to the south-southwest of India and Sri Lanka, comprises 1192 islands, of which 199 are inhabited. The country is spread over 859,000 square kilometres (including the sea within territorial waters). Compared to landlocked countries in the region, the Maldives faces unique development challenges due to vast distances that separate its 337,000 people (UNFPA 2006).

Development models and capacities have to contend with high transportation costs and distance-related logistical overheads. Since 1978, the economy has averaged a 9 percent annual growth rate, a tripling of its per capita income from 1980 levels, exceeding US$2400 in 2004. The country has achieved literacy rates of over 97 percent for both men and women. The United Nations Development Programme (UNDP)-funded Vulnerability and Poverty Assessment, carried out from mid to late 2004, placed the poverty level of the Maldives at 21 percent. These indicators, however, do not reflect the skewed nature of development in the Maldives. Income disparities are rising between the urban and outer atolls (Figure 1) and 28 percent of the rural atoll population subsists on less than US$1 a day, as compared to only 3 percent of the urban population (MPND 2004).
Nonetheless, the progress in the Maldives has been considerable in many fronts, and in December 2004, the United Nations proposed that the country would no longer be labelled a ‘least developed country’ within the following three years. However, the tsunami of 26 December 2004 showed how vulnerable small island states are, and it was reported that the Maldives was one of the worst affected countries on a per capita basis. The tsunami affected livelihoods of one third of the population in the Maldives, and total damage was estimated to be US$470 million, equal to 62 percent of the gross domestic product (GDP) (WB-ADB-UN 2005). The tsunami also drew attention to and exacerbated other problems that were already in existence. A reflection of the situation in the Maldives is captured in the Human Development Index (HDI), on which the country scored 0.739 in 2004, ranking 98th out of 177 countries (UNDP 2006). Currently, the Maldives is recovering from the devastating effects of the tsunami and regaining development momentum.

Despite progress, the Maldives remains vulnerable to external environmental threats such as climate change (MEEW 2007). Sea level rise, one of the most significant effects of climate change, is among the immediate environmental concerns in the Maldives, considering over 80 percent of its land area is less than one meter above sea level. Further impact of climate change would reduce access to drinking water, negatively affect the health of the population and pose a real threat to food security.

The Maldives is heavily dependent on energy imports, especially within the electricity and transport sectors. Electricity consumption has increased significantly from 42 million kWh in 1992 to over 97 million kWh

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in 2004 (NEP 2005). Even for domestic purposes, due to depletion of wood resources and regulations on its use, more households rely on kerosene and liquefied petroleum gas (LPG) for cooking than on biomass. The country is, therefore, vulnerable to the vagaries of international energy prices and supply. The Oil Price Vulnerability Index (OPVI), developed by the Regional Energy Programme in UNDP Regional Centre in Bangkok, ranks the Maldives the most vulnerable amongst 24 countries in Asia and the Pacific. The Maldives is a high-OPVI country because of its highly negative balance of payments and budget balance positions as well as its high import dependence (UNDP 2007).

It is therefore inevitable that a gradual shift from the fossil fuel based energy system to an environmentally-friendly, renewable or alternative fuel based energy system that uses energy efficient (EE) technologies will take place in the public transport and industrial sectors. The country has recognized the potential of solar, wind and modern biomass resources for meeting energy supply in a sustainable manner. The 6th National Development Plan (NDP) stresses the importance of adopting a sustainable energy policy for the country. The formulation of the draft NEP of June 2005 has been an important initiative undertaken by the Government and it can be used as a guideline for future energy sector development. A framework for energy policy and an institutional re-structuring of the energy sector is envisaged within the overall development policies. This would emphasize public-private participation, environmental management, business investment, promotion and privatization, and entrepreneurship development, among other endeavours in the energy sector. The four energy priority areas identified are:

- Provision of electricity at the atoll/island level, especially to remote islands, in a reliable, equitable and affordable manner;
- Development of a pricing policy for electricity provision;
- Reduction of the dependence on imported fossil fuels in terms of fuel storage capacity and vulnerability to price fluctuations; and
- Lessening environmental degradation and detrimental effects of global warming.

The Government has proposed the following strategies to explore possible sustainable sources of energy for power generation and desalination: (1) strengthen policy-making and regulatory bodies in the energy sector and formulate an energy policy; (2) train technical personnel at all levels of the energy sector, especially at the atoll level; and (3) conduct an awareness campaign regarding fuel consumption and sustainable use of energy sources.

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Although targets have been established, their implementation has been constrained by a number of factors. These challenges underscore the inadequacies that prevent provision of equitable access to modern energy services throughout the country.

**Poor institutional synergies and limited partnerships**

For a long time in the Maldives, energy issues traversed multiple ministries leading to isolated interventions within the mandated sectors of each respective ministry. In 2005, the Ministry of Communication, Science and Technology (MCST) was restructured into the Ministry of Energy, Environment and Water (MEEW), gaining a better focus on the energy sector and also on the inter-linkages between energy, the environment and water. Furthermore, the Maldives Energy Authority (MEA) was established in April 2006, which was followed by the abolishment of the former Maldives Electricity Bureau (MEB). MEA functions under MEEW (GoM 2006), forming a new regulatory body with a broader mandate for increased effectiveness of energy interventions. While MEEW still formulates energy policies, the regulation of the energy sector falls under the purview of the MEA (MEEW 2007). MEEW promotes energy conservation and efficiency in production and usage and also strives to reduce the dependence on imported fossil fuels (see Figure 2).

While the establishment of MEEW has, to some extent, led to the convergence of various players in the energy sector, there is an obvious lack of adequate capacities for developing specific interventions that incorporate poverty reduction. The proposed priorities of the Government and energy institutions lean more towards the creation of uniform regulatory frameworks and the reduction of import dependency than towards the goal of harmonizing strategies concerning energy with poverty reduction in order to correct socio-economic imbalances. That said, there are a number of major institutions in the Maldives whose current or potential work links poverty and energy (Table 1).

In the largely centralized institutional structure of the Maldives, there is limited participation by private business, bilateral/multilateral agencies and non-governmental organizations (NGOs) in the energy sector. In the private sector, while the exact number of independent power products (IPPs) is unknown, most are small family-run businesses that generate power for self-consumption or for their communities. Bilateral and multilateral agencies have many programmes in the rural islands of the Maldives, but they have had moderate impact in terms of
coordination across them. Since NGOs are not actively involved in the energy sector, the potential to reduce poverty through their non-governmental expertise and capacities is not realized.

At the decentralized level, energy supply and development functions are integrated into the wider social and economic mandate of the Atoll Development Committees (ADCs), Island Development Committees (IDCs), and Women Development Committees (WDCs). Central funds are routed through local institutions for expansion and development of energy services. The IDCs, however, play an important role as suppliers of electricity to islands not covered by the State Electric Company (STELCO) systems.

STELCO provides electricity services directly to consumers and industries in Malé and provides 24 hours of electricity to 24 of the 199 inhabited islands. IDCs, community and private providers generate and supply electric power in the rest of the islands. Therefore, the majority of Maldivians have access to electric power from some source. The total installed power generation in the country is 106.2 MW, much of which operates in the resort islands (48.3 percent). That of the outer islands, controlled by the IDCs and some private producers, accounts for 13.2 percent of the total power generation capacity. About 33 percent of the overall electricity generation in the country is through STELCO. The rest are those installed in airports.

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Generators operated by IDCs with the assistance of the Ministry of Atoll Administration (MAA) serve an additional 50 islands, and private providers serve six islands with 24 hours of electricity each day. The remaining 119 islands have at least 5 to 12 hours of electricity per day, leaving only two inhabited islands without any electricity. On a number of islands, however, several houses are unable to access electricity due to inefficient delivery capacity.

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<td>1. Ministry of Planning and National Development</td>
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<td>Plans for development of all sectors</td>
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<td>2. MEEW</td>
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<td>2.1. MEA</td>
<td>Formulates policy</td>
<td>Plans for power sector development</td>
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<td>2.2. Energy Advisory Committee</td>
<td>Regulates trade and industry in the energy sector</td>
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<td>Advises MEEW on energy sector planning and policy formulation</td>
<td>Strengthens the energy section of MEEW</td>
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<td></td>
<td>Deals with electricity generation, transmission and distribution</td>
<td>Expands electricity access in rural and remote areas</td>
</tr>
<tr>
<td>4. State Trading Organization (STO)</td>
<td>Imports fossil fuels</td>
<td>Makes available modern and commercial sources of energy</td>
</tr>
<tr>
<td>4.1. Fuel Supplies Maldives</td>
<td>Distributes marine gas oil, gasoline, kerosene and lubricants</td>
<td>Supplies petroleum products to consumers in islands and Male</td>
</tr>
<tr>
<td><strong>Local</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. ADCs, IDCs, WDCs</td>
<td>Channel centrally allocated funds for expansion of energy services</td>
<td>Supply electricity to rural areas for meeting energy-poverty concerns</td>
</tr>
<tr>
<td>6. International donors</td>
<td>Develop and diversify the energy sector</td>
<td>Seek cost-effective alternatives to commercial energy sources to boost energy access to the lower income groups</td>
</tr>
</tbody>
</table>

Energy and Poverty in the Maldives
Evolving policy and regulatory framework

The formation of MEEW is promising, because it has initiated institutional reforms that could lead to an integrated approach to energy, including the link to socio-economic issues. Since it also has the duties of regulating the environment and water sectors, MEEW is in a better position to harmonize the country's energy priorities with its sustainable development goals. The Ministry has also been able to resolve institutional conflicts between different stakeholders to a great extent. Further, policies such as those formulated in the 6th NDP (2001-2005), the draft Sustainable Energy Plan (SEP) of June 2004, and the draft NEP of 2005 have been introduced to harness sub-sectoral linkages and enable programme coordination in the energy sector. The SEP study was undertaken by the former MCST with support from United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). This national study was undertaken in consultations with all the stakeholders and players in the energy sector (UNESCAP 2004). The SEP sets targets for increased renewable energy capacity. It also proposes the formulation of Transport Energy Policy; to develop and implement programmes to make available energy resources to all the inhabited islands by 2008; and to reduce GHG emissions through the increased use of alternative energy and renewable energy technologies (RETs) (SEP 2004). An interactive and
participatory process was initiated as part of the formulation process of
the draft NEP between the Government, other stakeholders and relevant
groups in order to incorporate views of market actors and energy
consumers for addressing the complex nature of the energy sector. The
NEP sets a target of 12 percent for the share of renewable energy in the
energy mix to be achieved by 2015 (NEP 2005).

In the Maldives, the energy tariff structure is normally determined
through a process in which the local bodies recommend a price that is
then approved by the regulatory body, ensuring that the price is not
above a set ceiling. These are then implemented by the local bodies with
minor adaptations. Electricity pricing is a little more diffused, since the
IDCs determine local electricity rates. MEEW would, however, like to set a
uniform price across the Maldives, but no study has been conducted so far
to gauge the implications of such a measure.

As the IPPs are underrepresented in the energy sector, the focus of the
draft NEP of June 2005 is to encourage private power producers, and it
recommends tapping the inherent synergies between these producers
and STELCO. Additionally, the 6th NDP (2001-2005) has woven public-
private energy partnerships into its broader socio-economic vision for
the country, urging the development of sustainable partnerships to
enable the achievement of national development goals. The recently
released 7th NDP (2005-2009) also continues to focus on public-private
partnerships.

The IPPs are underrepresented in the energy sector.

BOX 2: KEY CHALLENGES FACING REGULATORY AND POLICY FRAMEWORK

- The existing regulatory framework lacks uniformity at the national
  and local levels, and excludes the rural energy sector in general and
  the renewable energy sector in particular.
- Electricity tariff structure has a strong bias toward urban residents:
  Residents of Malé pay considerably less for electricity than outer
  island households that spend a substantial 30-40 percent of the
  family income on electricity.
- Public-private energy partnerships have not been as successful as
  hoped, perhaps due to the presence of entrenched state-owned
  monopolies combined with a lack of financial mechanisms and
  discriminatory policies on funding the private sector.
- Specific regulations on independent power generation and the
  pricing and use of RETs are not currently in place.
- IDCs are not backed by legal statutes, and hence are unable to
  provide electricity as cooperatives.

Energy and Poverty in the Maldives
Absence of poverty focus in energy programme framework

The ongoing energy programmes in the Maldives have a substantial focus on electricity generation through diesel-run generators. Little attention is given to promoting renewable energy for enabling decentralized access to remote islands in order to meet energy needs. Although they incorporate reduced dependency on imported fuel by exploring sustainable energy sources in the country, most RET programmes have not advanced beyond the pilot stage. Few initiatives seek to enhance decentralized capacities for income generation and sustainable development (Table 2). RETDAP and the Atoll Development Project for Sustainable Livelihood, implemented by the Government with UNDP and other bilateral and multilateral support, are two examples where indeed this has been attempted.

<table>
<thead>
<tr>
<th>Strategy/Policy/Programme</th>
<th>Implementing agency/Donors</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. RETDAP</td>
<td>Global Environment Facility and UNDP, The Transnational Foundation, with co-funding from South Asia Regional Initiative-United States Agency for International Development (USAID), UNESCAP, the French Agency for Environment and Energy Management</td>
<td>Seeks to have a significant impact on the socio-economic indices of the less developed outer islands, which do not receive sufficient electricity and have limited power generation capacities of their own to meet both domestic and small industry needs</td>
</tr>
<tr>
<td>2. Outer Island Electrification Project</td>
<td>MEEW, Asian Development Bank (ADB)</td>
<td>Improves electricity services in about 40 remote islands and enhances income generation opportunities*</td>
</tr>
<tr>
<td>3. Assessments of least-cost, sustainable energy resources – Maldives</td>
<td>UNDP, Government of Norway</td>
<td>Fourteen assessments have been conducted so far to address energy concerns in rural and underdeveloped islands through development of low-cost, efficient energy services</td>
</tr>
</tbody>
</table>
**Table 2**

<table>
<thead>
<tr>
<th>Strategy/Policy/Programme</th>
<th>Implementing agency/Donors</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Electricity generation programmes</td>
<td>STELCO, ADCs and IDCs, with Central Government funding</td>
<td>Provides immediate relief from incidences of poverty emerging from a sustained lack of energy use for productive purposes in outer islands</td>
</tr>
<tr>
<td>5. Power sector rehabilitation and reconstruction programmes after the tsunami</td>
<td>ADB, USAID, Islamic Development Bank</td>
<td>Repair and upgrade power systems affected by the tsunami</td>
</tr>
</tbody>
</table>

* Financed through a US$8 million ADB-supported ‘Outer Island Electrification Project’ (RETDAP 2004).

**Box 3: Key Challenges in Establishing Energy Programme Framework with Focus on Poverty**

- Lack of attention to decentralized renewable energy programmes in outer islands.
- Requirement of capital-intensive physical infrastructure for renewable energy projects acts as a major barrier to investments.
- Limited support for research and development (R&D) and documentation of key pilot projects and prior experiments, particularly those with impacts on poverty reduction.
- Difficulty in inducing investments through programmes that receive mainly technical assistance support from international bodies to meet their programme formulation and planning needs.
- Specific interventions for lower income groups, such as the introduction of improved cook stoves, which would contribute to curbing respiratory illnesses among women and enhancing productive end-use of energy to boost income generation, have been rare.
- Inadequate participation of communities or entrepreneurs without governmental or international partner support in the renewable energy sector.

**Access to modern energy services**

Households in the Maldives rely on diesel, kerosene, LPG and biomass for their energy needs (Figure 3). Specifically, outer island households still depend on biomass, including fuelwood, for most cooking energy

*Energy and Poverty in the Maldives*
requirements. The utilization of biomass was approximately 4,626 tonnes of oil equivalent (toe) according to the Maldives energy balance in 2002 (ECN 2004), which makes up 24 percent of the accessible biomass resources (NEP 2005). However, biomass (shrub and coconut husks) use is under threat due to rapid deforestation in the outer islands. Communities are, therefore, switching to LPG, but its cost and uncertainty of supply, which is dependent on an inefficient inter-island transport network, are hampering the switchover. In 2005, consumption of biomass had reduced to 2,763 toe (ECN 2007).

Almost all households have some access to electricity: 197 of the 199 inhabited islands receive electricity for at least five hours a day, and 82 islands have 24-hour access (ECN 2004). Great disparities exist in terms of affordability, availability and quality of services between the urban areas of Malé and Villingilili and the rural outer islands. Diesel in particular dominates the fuel market, accounting for more than 80 percent of total primary energy demand and almost all electricity generation. The reliance on imported diesel for economic activity has placed a considerable burden on the country. Besides, it inhibits income generation and growth of small and medium enterprises (SMEs) in the outer islands, which do not have direct access to imported diesel and must purchase it from resellers at a huge mark-up.

**FIGURE 3**
Disparity in access to commercial sources of energy
Coordination and partnerships, or lack thereof, among different stakeholders and institutions at different levels are closely linked to capacity issues. Technical and managerial capacities in energy transmission and distribution are mainly confined to STELCO, as well as to some private power producers servicing resorts. Limited trained staff members and technical expertise in system operation, repair and maintenance have influenced the performance of private producers. Private producers experience high distribution losses (24 percent) as compared to STELCO (13 percent), which has higher capacities (NEP 2005). At the same time, STELCO is reported to be in financial loss in operating electricity systems in a number of islands due to the prevailing high price of imported fuels and its transportation costs as well as relatively high administrative costs for maintaining increasing staff in the islands. Improved decentralized capacities are needed for enhanced income generation and sustainable development.

It has not been possible to widely adopt renewable energy sources in both urban and rural areas, and the use of solar dryers, solar cookers and wind generators has been undertaken only on a pilot project basis. The Government has sought to increase the pace of renewable energy adoption by considering the introduction of a Renewable Energy Portfolio (REP), which would devise strategies to increase the share of renewable energy in the total energy generation to 12 percent by 2015 (NEP 2005).

Box 4: Key Challenges in Providing Modern Energy Access for Poverty Reduction

- Because all major ports handling fuel imports are concentrated around Malé, and inter-island transport networks are inefficient and expensive, the outer islands lack direct access to imported fuel.
- Most IDC-supplied islands do not receive 24-hour electricity supply, because most local producers lack adequate technical capacities to maintain and operate 24-hour power plants.
- Lack of awareness about renewable energy and its applications, potential and success stories, prevent its wider adoption.
- The assistance provided for renewable energy projects covers a small proportion of the costs.

Limited energy entrepreneurship

In the Maldives, poverty has not been reduced significantly through livelihood enhancement activities. One of the reasons could be the
absence of dynamic energy entrepreneurs and the associated income
generation opportunities. Revenues from tourism and fisheries account
for more than 66 percent of the country’s GDP, which translates into a
strong demand for energy services. The demand for energy services is
matched by the ability to pay, yet only limited energy services exist,
highlighting the absence of a robust entrepreneurial energy network.
Access to energy services of rural micro-enterprises, such as fish- and
coconut-processing plants is even more limited. They use predominantly
inefficient biomass energy sources such as brushwood and coconut
husks, because access to electricity and diesel is restricted and expensive.

To develop capacities for entrepreneurship, the Faculty of Engineering
Technology in Malé conducts a series of short courses for technicians,
operators and other stakeholders. These courses introduce participants to
subjects such as refrigeration, air-conditioning and engine operations in a
bid to promote energy-related SMEs. However, at the island level,
insufficient technical and accounting capacities stand in the way of the
development of energy-related SMEs.

Box 5: Key Challenges in Driving Energy Entrepreneurship

- Large-scale entrepreneurship in electricity generation is hindered
  by the prohibitive costs of diesel and lack of technical expertise.
- Efforts to encourage energy-based entrepreneurship are hampered
  by lack of awareness and access to energy services, in terms of
  feasibility studies and energy data.
- Transparent and proactive state-level policies related to energy-
  based micro-enterprises and SMEs are not in place.
- There are no regulatory policies to check discriminatory and partial
  funding of energy projects, leading to an unbalanced investment
  climate.

Constrained access to finance

Funds for energy development projects undertaken by communities and
private entrepreneurs range from some business loans offered by
commercial banks to small credit schemes offered by international
donors and local government bodies. Traditional sources of finance, such
as commercial banks, have limited effectiveness on Maldivian rural
islands. The inability of disadvantaged groups to provide collaterals
against loans and lack of high-return investment opportunities in the outer islands obstruct greater development of the rural energy sector. However, the Government has sought to fill the gap by providing a range of financial mechanisms to develop outer island economies (Table 3).

<table>
<thead>
<tr>
<th>Financial mechanism</th>
<th>Implementing agency/agencies</th>
<th>Fund details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit facilities for meeting local energy needs</td>
<td>MAA, through ADCs and IDCs</td>
<td>Credit provided primarily for the purchase of diesel electricity generating sets</td>
</tr>
<tr>
<td>Atoll Development Fund (ADF)</td>
<td>MAA, UNDP</td>
<td>Credit provided for both community-based and individual income-generating activities</td>
</tr>
<tr>
<td>Revolving Electricity Fund (REF)</td>
<td>Government of the Maldives</td>
<td>Credit provided for community initiatives to establish or upgrade electricity generation capabilities</td>
</tr>
<tr>
<td>Fund for Renewable Energy System Application (FRESA)</td>
<td>Government of the Maldives, RETDAP</td>
<td>Funds provided for microfinance facilities, and technical assistance to promote and encourage renewable energy systems</td>
</tr>
<tr>
<td>Government grants to support community initiatives</td>
<td>MEEW</td>
<td>Grant aid provided for community initiatives to establish or upgrade electricity generation capacities</td>
</tr>
</tbody>
</table>

Government-supported microfinance mechanisms such as the Atoll Development Fund (ADF) and Revolving Electricity Fund (REF) have emerged as viable alternative sources of funds to enhance rural energy entrepreneurship and access to energy services. However, effectiveness of the national-level REF has been reduced by a short repayment period and limited credit ceilings.

Microfinance for renewable energy development is planned through RETDAP, although the allocated funds are not sufficient to meet the initial hardware costs of most renewable energy systems. Moreover, government sources of finance in the energy sector, such as subsidies and grants, have been slow to reach the disadvantaged groups, especially women.

_Energy and Poverty in the Maldives_
Gender concerns in energy issues

While women in the Maldives have made good progress on many fronts, a significant proportion remains vulnerable to poverty, especially in the rural areas. Socially prescribed roles have limited women’s access to economic resources such as land, capital, skills and know-how, and many challenges to improved gender equality persist. However, there is no wage discrimination between men and women in the Maldives. Even though women do take active part in most developmental projects, awareness of specific possibilities for female entrepreneurs and emphasis on encouraging women’s entrepreneurship is lacking. Also special interventions for women, such as improved cook stoves, which would contribute to curbing respiratory illnesses among women, have been rare.

Box 6: Key challenges in financing energy for poverty reduction

- Energy project loans are given only to individuals who prove their capacity to pay back the loan by putting up collateral, depriving a large segment of the rural population of the necessary finances to implement micro-energy projects for household and productive use.
- In the available credit mechanisms, the low credit limit in the REF is partly a result of shortage of available seed capital, and demand often surpasses the funds available for disbursement.
- Stringent funding conditions restrict credit for renewable energy development.
- Policies encouraging private and public investments are lacking due to the centralized nature of financing energy services.

Box 7: Key challenges in promoting gender equality

- The WDCs do not have sufficient capacities to integrate and effectively represent gender perspectives on energy issues.
- Within the IDC framework, only one WDC member sits on a committee of 12, which results in institutionalized under-representation of women’s concerns related to energy use and efficiency.
- Since access to loans beyond Rufiyaa 15,000 (US$1192) requires collateral in the form of fixed assets, women are at a disadvantage.
**Dispersed and weak information sharing system**

The most common form of knowledge sharing and transfer at the national level is through training workshops, seminars and periodic interactions. In addition, research reports conducted by various agencies are available on the Internet. However, at the island and community levels, demonstrations, exhibitions and audio-visual presentations are mostly lacking. Moreover, there is limited public access to studies, and information on assessments related to energy is often not fully documented and disseminated.

**Box 8: Key challenges in information sharing related to energy and poverty**

- Annual reports, yearbooks and energy balance reports are the main accessible energy information sources in the Maldives.
- MEEW has made limited progress in extending access to information on renewable energy.
- Deficient information in the electricity sub-sector prevents accurate assessment of the country’s energy sector.
- The electricity generation and distribution information of STELCO is confined to the organization, and private power producers do not readily share such information.

**Centralized and weak monitoring and evaluation system**

Monitoring of poverty in general, and the impacts of energy services on poverty reduction in particular, have not received due attention. Indicators demonstrating links between poverty and energy services have not yet evolved, though data on disparities in terms of access, affordability and availability of energy services could serve this purpose. This would also help define national priorities in the energy sector. Limited capacities for monitoring and evaluation (M&E) also constrain efforts to implement the Poverty Reduction Strategy Paper.

**Box 9: Key challenges in strengthening the monitoring and evaluation system**

- With current M&E procedures concentrated at the central level, decentralized institutions are restricted to completing assessment forms and questionnaires, resulting in a loss of information on the impacts of energy services on poverty, which can be evaluated more effectively at the decentralized level.
- Energy institutions do not have sufficient M&E capacities to develop a sound M&E system, however, the aim of RETDAP is to build substantial M&E capacities at the national and local levels.

*Energy and Poverty in the Maldives*
Improved coordination, capacities and partnerships for poverty reduction

Improved coordination between relevant government agencies and their energy-related development interventions, as well as improved capacities to formulate strategies could significantly enhance the provision of energy access for the poor. It would be desirable to further support MEEW as the nodal agency. Enhancing the capacities of government entities to enable the provision of energy services for the poor, create opportunities for poverty reduction, and improve the coordination of all energy-related policies and programmes of different ministries is desirable.

Appropriate further support could be extended in the form of relevant training. The capacity needs of MEEW could be assessed as well as that of other relevant ministries and local government units on energy policy and strategy, information gathering, processing, analysis and management, programme development and implementation, and M&E, which would then be followed by capacity development activities. MEEW could also conduct a review of energy-related socio-economic development programmes of various ministries exploring possible duplications, complementarities and synergies. The aim could be to formulate an integrated action plan that will coordinate and synchronize efforts of relevant ministries towards improving or providing access to energy services for the poor.

Improvements in the provision of energy services for poverty reduction also necessitate the development of partnerships between public utilities and private entrepreneurs. The current operational status of STELCO, private sector and IDC/community managed power stations reveals that there are both technical and managerial problems, which could be addressed through joint collaboration and partnership between the public and private sectors in a ‘business-like’ approach. This would improve energy delivery and promote decentralized economic development. To enhance this, STELCO could transfer some of its distribution and generation capacities to private sectors and local entrepreneurs (distributors only), and in so doing reduce its financial liabilities. Additionally, existing IDCs could be converted into cooperatives, and partnerships between resort owners could be promoted on the mutually beneficial energy projects in outer islands, as part of meeting their corporate social responsibilities. It is also desirable to promote a level playing field for NGOs and IDCs in the financing, implementation and operation of energy projects as a way to harness
their capacities. Furthermore, such public-private partnerships need to be encouraged in developing cost-effective renewable energy solutions through putting clear policy environments in place.

It would also be beneficial to identify and analyse the root causes and effects of the lack of private sector participation in the provision of rural energy services, as well as in the provision of energy projects that are specifically aimed at providing energy access to the poor. Also realistic and achievable objectives should be set to address the root causes and effects of limited private sector participation.

For developing such partnerships, MEEW, the Ministry of Atolls Development (MOAD), the Ministry of Tourism (MT), and the Ministry of Finance and Treasury (MFT) can together find a mechanism to provide guidance and technical expertise to private entrepreneurs in the energy sector and create an enabling environment for fair market competition with existing monopolies. MEEW could also facilitate the utilization of capacities of various national and international stakeholders. Enhancement of capacities would also entail significant investments in R&D, infrastructure and human resources. In this context, the Government and its international partners should consider budgetary support for institutions such as the Environment Research Centre and the Faculty of Engineering Technology, which could be made certified centres for capacity-building on energy and poverty and training of private entrepreneurs.

**Policy and regulatory framework oriented towards lower income groups**

Regulatory framework, policy guidelines and other incentives, including credit facilities for investment in the energy sector, need to be enhanced to provide a suitable environment for partnerships and to contribute to socio-economic development, in general, and poverty reduction and livelihood support, in particular. To enhance the provision of energy services for poverty reduction of communities in remote islands, the Government should review current policies and regulations on energy imports/generation, supply and distribution; assess root causes and effects of the weak regulatory process; and come up with feasible interventions to address these causes and mitigate the effects. Based on the findings, the Government could formulate a comprehensive policy and regulatory framework that sufficiently includes rural energy and renewable energy sectors. Policy support activities should also be developed that will ensure strengthened policy-making and implementation processes. For example, an implementation plan for the NEP (including implementation
rules and regulations) to ensure proper policy enforcement, M&E and feedback should be formulated.

Providing energy to the lower income groups to reduce poverty involves two key issues: access and affordability. It is, therefore, imperative to review the existing tariff policy (including the guidelines for tariff-setting) with a firm focus on the lower income groups and the deprived communities. MEEW could possibly establish tariff-setting and tariff-monitoring guidelines through MEA. The draft NEP should provide appropriate bearing on the basis of its policy guidelines on expediting energy options and financial incentives for low-income households.

Socio-economic development and poverty reduction policies that enable fair market competition with existing monopolies should be encouraged and implemented as well as incentives for the private sector to venture into the energy provision business in rural areas. The private sector can be encouraged to bid for the competitive energy market and support should be given for joint partnership between STELCO and IPPs. More specifically, the established regulations should define the relationship between the IPPs and STELCO. By reviewing and assessing the existing mandates, policies and implementation arrangements in the area of energy (electricity and petroleum) generation, supply and distribution, the Government could come up with feasible alternative options. An evaluation of the advantages and disadvantages of feasible options could result in firm recommendations. For example, assessment could lead to the transference of electricity distribution responsibilities of STELCO to private sector and local institutions. Furthermore, financial, technical, logistical and management requirements for the various feasible options should be identified, as well as potential private sector entities, and national and local government agencies that can adequately and satisfactorily comply with the decentralization of energy generation/importation, supply and distribution.

The Government also needs to create more awareness and establish more efforts to encourage IDCs to start cooperatives. This would strengthen capacities in energy services both for consumptive and productive purposes, especially for the communities in the outer islands. Perhaps MOAD, the Ministry of Justice, MT and other ministries overseeing the cooperatives could monitor proposed laws. Policy implementation and impacts should also be monitored and evaluated, and policies and rules and regulations should be revised if necessary.

To incorporate the concerns of the deprived and remote communities, policies must push for a rapid development of renewable energy sources and indigenous resource development. In this context, the Renewable Energy Action Plan (REAP) should be integrated with the draft NEP. In
other words, the benefits of renewable energy and RETs should be promoted widely to national and local government agencies and private entities. Policies to encourage public-private partnerships in the area of renewable energy should be integrated into the national and local development policies and plans. National and local governments should endorse and support a financial plan for the renewable energy development and utilization plan, as well as a suitable implementation framework (including M&E) for the renewable energy development and utilization plan. After evaluation of the plans, new or revised policies to suit evolving requirements and necessary improvements could be recommended.

Enabling energy programme framework

A mechanism to mainstream poverty concerns through energy interventions may evolve. One of the major inputs to addressing the poverty concerns of the deprived communities in remote islands is the provisioning of decentralized energy programmes with livelihood components. More attention should be given also to promoting renewable energy for enabling remote islands to meet their energy needs. Potential scope of energy projects that are, among other goals, meant to support socio-economic development and livelihood support activities of rural people in the outer islands should be assessed. These types of projects (using renewable and/or non-renewable resources) should be identified and given priority based on best available and most feasible technologies, and economic and financial viability. Once the plans are made, however, enhanced resource mobilization to set up capital-intensive physical infrastructure for renewable energy projects is needed. Identified energy projects should be promoted to potential funders (bilateral and multilateral), including local banking/financing institutions and the private sector, as a comprehensive package and not just stand alone pilots.

Existing livelihood programmes could facilitate deployment of funds towards renewable energy projects as well. Adequate evaluation may be carried out to ensure sustainability and effective utilization of funds. This would enable the mobilization of greater resources than currently allocated, for instance to RETDAP (RETDAP 2004). RETDAP could facilitate provision of all solar energy-based fish dryers and provide low-cost energy equipment. It could also collaborate with tsunami relief operations, which already have a livelihood component (UNDP 2005).
Increased support of energy programmes for R&D and documentation of key pilot projects and prior experiments could be developed with the activities carried out under RETDAP or similar projects that deal with renewable energy resource assessments and assessments of technical and logistical requirements of feasible RET applications. Annual monitoring of renewable and non-renewable energy projects in the country and documentation of each project’s profile, performance and results would be important, as well as information dissemination of materials on the monitored energy projects and information exchange on other applicable projects implemented elsewhere.

It would be beneficial if energy programmes included conducting continuous renewable energy resource (wind, solar, biomass and landfill gas) surveys in their activities in selected areas in the country where there are renewable energy resource potentials. The programmes could assess the technical requirements for wind and solar technology applications (e.g., measurements of wind velocities and solar radiation intensities) and for other relevant RET applications.

**Facilitating access to energy**

Limited financial resources, shortage of energy supplies, expensive and unreliable transportation of fuels, lack of technical capacities and limited awareness of renewable energy and EE technologies are the key issues to be addressed while aiming to enable equal access to energy.

To counter energy supply shortages, especially in remote islands, suitable provisions could perhaps be made to encourage block storage at the atoll level. As for issues related to the transportation of fuels to outer islands, forging public-private partnerships in the fossil fuel supply chain could be the way out. As discussed, it would be desirable to open up the market for the import of fuels through the private sector route. Therefore, direct import by the private sector of commercial energy forms (e.g. remove STO monopoly on petroleum fuel imports) can be assessed.

The promotion of feasible alternative energy technologies (e.g., RETs, EE appliances) for households and small industries is also important, because, as mentioned earlier, poverty levels are high in the outer islands where biomass is the main source of energy. These areas would benefit from greater use of improved biomass technology, such as improved cook stoves and gasifiers, in terms of energy efficiency and reduction of indoor air pollution, including carbon dioxide emissions, resulting in improved health conditions. To promote decentralized access for the poor and deprived sections of the community, a donor fund could be mobilized to
support the Government’s initiatives. Enabling access to energy for the poor might mean that donor support should be utilized in a manner that also ensures financing of the hardware costs of renewable energy systems and EE appliances. The Fund for Renewable Energy System Application (FRESA) could be expanded to cover financing for the purchase of EE appliances.

To further enhance awareness on renewable energy, the information dissemination programmes initiated under RETDAP, or under other projects with similar aims, could be continued and expanded to include awareness-raising in the widespread practice of the efficient and effective use of commercial energy forms. Private entrepreneurs and IDCs with experience in modern/renewable energy and enhanced technical capacities could be better suited for developing renewable energy and non-renewable energy systems in the islands, especially in isolated small islands where demand for energy services is limited.

As discussed, through public-private partnerships, some of the STELCO managed electricity systems could be transferred to the private sector and to improve the energy efficiency thereby generating electricity in a profitable manner. Private sector companies or energy service companies (ESCOs) could play important roles in energy production and distribution and should be encouraged to serve as IPPs for conventional, modern and renewable energy systems. However, at present, STELCO dominates in the electricity generation market, as well as in technical know-how, therefore, improving technical capacities of the rural entrepreneurs in electricity generation is crucial for achieving increased efficiency in the energy sector.

To improve capacities to manage rural energy and also enhance building of frameworks for incorporating modern/renewable energy sources, several assessments could be conducted: (1) an assessment of the specific capacity development needs of rural communities in the provision of energy services; (2) an assessment of the potential scope of application of modern/renewable energy sources in existing rural energy infrastructures; (3) an assessment of the financial, technical, logistical and operational requirements of potential applications and how these will be provided and supported; and (4) an assessment of how the potential applications can support socio-economic development and livelihood activities of rural people in the outer islands.

With the results of these assessments, private entrepreneurs and IDCs working in rural communities could then be provided the necessary and appropriate capacity-building to enable them to operate and maintain improved energy systems that employ modern/renewable energy sources and also given capacity-building on the wise and proper use of energy to operate productive activities.

*Energy and Poverty in the Maldives*
Driving entrepreneurship

Acknowledging the current energy scenario, the nation’s policy makers are committed to enabling a thriving industry on the generation and distribution of energy services. These commitments are visible in policies such as the recently expired 6th NDP (2001-2005) and the Regional Development Plan. The latter aims to create industrial growth centres outside the Malé region with a focus on energy-based income generation activities.

A driving force for reducing poverty and fostering economic development can be created through the integration of SMEs in energy programmes. As such, partnerships should be encouraged and efforts should be directed at developing a fair and competitive market. Eventually, this market could replace or complement monopolies such as STELCO and STO. The Government could also benefit from this on account of restrictions in the scope of subsidies and grants. To enable the formation of such a dynamic market, it is necessary to have a comprehensive National Policy and Action Plan aimed at market liberalization for fair and free competition.

Enhancement of capacities for energy entrepreneurship calls for stronger partnerships with centres of excellence within and outside the country. As a first step, the Government could introduce training programmes at the national, atoll and island levels. The Environment Research Centre and the Faculty of Engineering Technology could be the certified trainers for issues related to energy, poverty and policy. The Faculty of Engineering Technology has been addressing this need by conducting a series of short-term and mobile courses for technicians, operators, and other staff. At the local level, IDCs and ADCs need to integrate energy issues into their short-term training courses on community development, credit management and micro-enterprise development in collaboration with WDCs and NGOs. As part of the support framework, a provision of capacity-building in the marketing of rural products and a creation of market for rural products could be included and implemented.

In order to design and conduct appropriate and advanced capacity development programs for energy entrepreneurs in the operation and maintenance of power generation and distribution systems, an assessment of the actual capacities of IPPs in operating and maintaining power (renewable energy-based and/or non-renewable energy-based) generation units and distribution systems should be conducted. Also, an assessment of the operating performance of all power generation units and distribution systems in the country could be very useful. Additionally, identification of feasible measures to improve the performance (e.g., heat rates, load factor, availability) of existing power generation units, as well as the
performance of the distribution systems (e.g., reduction of technical and non-technical losses) would be beneficial. In general, improved energy data would encourage energy-based entrepreneurship.

Furthermore, a programme that would engage the local IPPs and IDCs that have relatively good performance in the operation of power generation systems as a way to assist other IPPs and IDCs in the country should be developed. Programmes for improving power generation performance and reducing loss in distribution systems in the outer islands could be conducted.

**Facilitating access to finance**

Finance is critical to bridging the gap between energy and poverty. As noted earlier, at the macrolevel, international donor agencies that can provide support to local banks for energy financing need to be identified, because tapping international funding agencies for REF would be necessary. Also, setting up a fund to support government subsidies for the poor could be considered. These resources need to be more responsive to the local energy and development needs. Strategies may be evolved for effective utilization of these resources for implementation of renewable energy projects. Local banks need assistance in discussing, negotiating and establishing funding for local energy project financing.

Efforts similar to the RETDAP that promote the benefits of renewable energy and RETs in meeting socio-economic development goals in all areas of the Maldives should be expanded for greater coverage. For example, the coverage of FRESA could be expanded to productive use of renewable energy projects in other outer islands. The impacts of the existing policy recommendations on financing of renewable energy projects under RETDAP could be reviewed, as could the existing banking/financing policies regarding the projects that they support. Also, information concerning the benefits and financial viability of RET applications for the provision of rural energy services should be extended to both government and private sectors, including banks and financial institutions.

At the microlevel, it is important to consider innovative financing modalities such as micro-credit without collateral but through instruments like group guarantees and WDCs. In this context, a review of the performance of the RETDAP-established FRESA is also important. Based on its performance, FRESA could be either modified or expanded. Another option is to develop a separate, sustainable financing scheme that is based on affordability.

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A study of various options for financing decentralized energy projects (renewable energy-based in particular) could be conducted, including the potential financing entity for each, and a mechanism (including implementing rules and regulations, considering the requirements of the selected funding entity) could be developed for the most feasible, affordable and accessible scheme. Formulation of policies regarding financial incentives that can be potentially provided to support renewable energy projects could be therefore based on, among other factors, the existing RETDAP recommendations and performance evaluation of the FRESA. Also, regulatory policies concerning the provision of rural energy services should be developed and implemented.

An assessment of the financial capacity of entrepreneurs and energy consumers in rural communities and the loan/financing requirements of local banks should be conducted. This would help designing of financing schemes which take into consideration the financial capacities of potential borrowers and requirements of funding organizations. Further, the one-stop-shop financing scheme for energy projects should be scaled up along with other viable financing models. In this context, it would be useful to study and adopt good practices from other countries in the region, such as Bangladesh and Nepal.

In all the above-mentioned financing options, MOAD and the Bank of the Maldives can together take on the initiative. The Maldives Monetary Authority and MFT, supported by MEEW, can spearhead and coordinate the process.

**Tackling gender concerns**

The 6th NDP (2001-2005) emphasizes gender equality in all socio-economic decision-making processes. This could reduce gender conflicts in areas such as that regarding access to energy where women have generally been at a disadvantage. It would also be desirable to enhance national and local capacities for analysing gender issues as a whole; consolidating disaggregated data; strengthening technical expertise; and assessing energy linkages with health, education and income generation activities at the national, atoll and island levels.

There is a need to create more awareness on possibilities for female entrepreneurs and to put emphasis on encouraging women’s entrepreneurship. It would be useful to promote specific gender interventions with the objective of increasing women’s societal roles in productivity related to energy issues. Thus, it is important to promote relevant technologies such as improved cook stoves and solar-energy-run...
fish dryers which also help reduce respiratory illnesses among women, as well as other specific technologies which help reduce women’s labour and increase their productivity.

The primary responsibility to deal with all these issues should lie with the Ministry of Gender and Family, which could collaborate with MOAD, MEEW, UNDP and the United Nations Population Fund to mainstream women’s perspectives on energy.

**Facilitating access to information**

Several initiatives could be taken to facilitate faster access to information, especially related to energy and poverty. Formulating and implementing a ‘right to information’ law could help promote access to government information. MEEW could establish a data collection mechanism and maintain information databases on the Internet related to poverty concerns, energy suppliers and importers, etc. Energy information centres could be set up, preferably at MEEW, and the national library could be encouraged to create an energy section. However, to develop robust systems for facilitating information on energy and poverty and linkages between them, MEEW could extend the experience of a one-stop information shop for all renewable energy information to the entire energy sector, particularly the electricity sub-sector. It should also consider replicating this resource centre elsewhere to generate community enthusiasm and promote participation in renewable energy programmes.

With respect to renewable energy information, RETDAP’s initiative has been able to address a few gaps, benefiting communities in remote and outer islands. It has achieved this through conducting a pilot demonstration and publishing awareness material. It would be beneficial to continue the information dissemination programmes and the Information Exchange Service initiated and set up under RETDAP or other efforts with similar aims, with emphasis on the (1) annual monitoring of renewable energy-based energy projects or installations in the country; (2) documentation of the profiles of monitored projects/installations; (3) compilation of information materials on RETs that are applicable and feasible in the country; and (4) preparation and dissemination of abstracts and information notes on relevant articles on RETs.

**Setting benchmarks for monitoring and evaluation**

The task of M&E becomes difficult in the absence of appropriate quantitative benchmarks related to energy and poverty and linkages
between them. Thus, it is important to set up a system for primary data collection. For renewable energy, RETDAP could function as the lead in developing the data collection system further. The detailed survey on energy supply and consumption in the Maldives that was carried out under RETDAP for establishing the country’s Energy Balance could be complemented. This could involve the development of an annual energy monitoring and reporting system (EMRS), including support for policy, mechanics, and implementing rules and regulations, and conducting energy monitoring and reporting according to the established system. Other appropriate mechanisms followed in projects funded by international agencies could also be adopted.

EMRS data should be regularly collected and data collection processes should be regularly assessed in order to establish reliable sectoral energy supply and consumption data, as well as specific energy consumption, energy demand and energy trends/profiles, and energy forecasts. Also, energy consumption benchmarks could be developed. This data could be disseminated through the Information Center’s Information Exchange Service. The information from EMRS could be then used for national, local and sectoral energy planning. Some specific indicators relating to poverty and energy concerns could be monitored, including the following:

- Number of atoll and remote island-level energy-based enterprises
- Number of decentralized energy providers for remote islands
- Number of schools and health centres in rural areas accessing grid electricity

The Maldivian Government’s NDP (2005), the draft NEP of 2005 and current strategies have given high priority to the development of the energy sector. The emphasis of these is on strengthening the institutional framework of its energy sector. The formation of MEEW in June 2005 has initiated institutional reforms that can lead to an integrated approach to energy, including linkages with socio-economic issues in the Maldives. MEEW is placed in a better position to harmonize the country’s energy agenda with its sustainable development agenda. These initiatives provide for a very strong ground to develop further energy access led development goals.

RETDAP and the Atoll Development Project for Sustainable Livelihood, implemented by the Government with UNDP support, have also sought to enhance decentralized capacities for income generation and sustainable development. In spite of these efforts, renewable energy sources have not been adopted widely in both urban and rural areas to meet increasing
energy needs. The Government has sought to increase the pace of renewable energy adoption by considering the introduction of a REP, which would devise strategies to increase the share of renewables in the total energy generation to 12 percent by 2015 (NEP 2005).

To address the issues and challenges related to delivering energy services for poverty reduction, priority should be given to further strengthening the capacity of energy institutions at the national and local levels and their delivery mechanisms. Another area of focus to enhance energy access to the poor necessitates the development of partnerships between public utilities and private entrepreneurs, including removal of barriers to private sector participation. This would improve energy delivery and promote decentralized economic development. Further, such public-private partnerships need to be encouraged in developing cost-effective, decentralized and gender sensitive renewable energy programmes. These will require support for technical assistance as well as increased levels of investment and financing support from the Government, private sector and donor communities.
SCHEMATIC REPRESENTATION OF CHALLENGES AND MODALITIES TO MEET THE CHALLENGES

THE CHALLENGES

- Limited coordination and capacities of relevant government entities in formulating strategies to enable the provision of access to energy for the poor and to create opportunities for poverty reduction
- Lack of coordination, cooperation and partnerships among the different institutional actors in the area provision of electrical energy (e.g. between STELCO and IPPs)
- Limited private sector participation in supply and distribution of electricity

MEETING THE CHALLENGES

- Assess capacity development needs of the MEEW as well as relevant ministries and local government units
- Design and conduct capacity development activities for MEEW relevant ministries and local government units
- MEEW to review energy-related socio-economic development programmes of various ministries exploring possible duplications, complementarities and synergies and also to formulate an integrated action plan for coordination towards improving or providing access to energy for the poor
- MEEW, the Ministry of Atolls Development (MOAD), the Ministry of Tourism (MT) and Ministry of Finance and Treasury (MFT) to provide guidance and promote potential partnerships between public utilities and private entrepreneurs for improving energy delivery and enhancing decentralized economic development
- STELCO to partner with IPPs and transfer some capacities to private commercial entities. Convert existing IDCs to cooperatives; promote partnerships with resort operators on the implementation of mutually beneficial energy projects in outer islands
- Monitor and evaluate policy implementation and impacts, and revise policies and rules/regulations if necessary
- Identify and analyse the root causes for and effects of the lack of private sector participation in the provision of rural energy services, as well as energy projects that are specifically aimed at providing energy access to the poor
- Set realistic and achievable objectives to address the root causes and effects of the lack of (or limited) private sector participation
- Formulate and implement policies and incentives that enable fair market competition with existing monopolies
**THE CHALLENGES**

**Weak regulatory process**

- Review current policies and regulations on energy importation/generation, supply and distribution, and assess root causes and effects of the weak regulatory process in order to come up with feasible interventions to address the causes and mitigate the effects.

**Existing tariff framework has a strong urban bias**

- Review the existing tariff policy (including the guidelines for tariff setting) with a firm focus on lower income groups and deprived communities.

- MEEW could establish tariff-setting and tariff-monitoring guidelines through MEA.

**Existing mandates prevent efficient generation, supply and distribution of energy (electricity and petroleum), and sufficient regulations to govern IPPs, IDCs, and renewable energy (RE) are not in place**

- Evaluate the pros and cons of feasible options (e.g., transfer electricity distribution responsibilities of STELCO or fuel importation and supply mandates of STO to private sector and local institutions) and come up with firm recommendations.

- MEEW could establish tariff-setting and tariff-monitoring guidelines through MEA.

**Inadequate policy focus on rural energy, in general, and RETs, in particular**

- Promote the benefits of RE and RETs; Integrate policies on RE development and utilization in national and local development policies and plans, ensuring that provision of rural energy services for supporting productive uses and livelihood support programmes are incorporated.

**Policy and Regulatory Framework**

**MEETING THE CHALLENGES**

- Advocate and promote the inclusion of specific policies in NEP that link the provision of energy to support socio-economic development goals, in general, and in rural areas in the outer islands, in particular; Formulate an implementation plan for NEP (to include implementation rules and regulations) in order to ensure proper policy enforcement, M&E, and feedback.

- Develop policy support activities that will ensure strengthened policy-making and implementation processes.

- The Government needs to create more awareness and establish more efforts to encourage IDCs to start cooperatives. MOAD, the Ministry of Justice, the MT etc. could monitor the proposed law.

- Identify and establish financial, technical, logistical and management requirements for the various feasible options; Identify potential private sector entities and national and local government agencies that can adequately and satisfactorily comply with the decentralization of energy generation/importation, supply and distribution; Develop and implement policy measures and programmes to support identified feasible options for decentralization of energy generation/importation, supply and distribution.

- National and local governments to endorse and support a financial plan for RE development and utilization, as well as a suitable implementation framework (including M&E) for the RE development and utilization plan.

- After evaluation of the plans, new or revised policies to suit evolving requirements and necessary improvements should be recommended.
Schematic representation of challenges and modalities to meet the challenges (continued...)

**The Challenges**

- **Lack of support for R&D and documentation on key pilot projects and prior experiments**
- **Limited development of energy projects (RE- and/or non-RE-based) that specifically focus on providing access to energy services for the poor**
- **Limited resource mobilization by the private sector to set up capital-intensive physical infrastructure for renewable energy projects**

**Programme Concerns**

- Assess potential scope of energy projects that are meant to support socio-economic development and livelihood support activities of rural people in the outer islands.
- Identify and prioritize energy projects (using RE and/or non-RE resources) for the provision of rural energy services, which can support and improve livelihoods of the poor in the outer islands;
- Identify specific project designs based on best available and most feasible technologies and economic/financial viability.
- Promote identified sustainable energy projects to potential funders (bilateral and multilateral) including local banking/financing institutions and the private sector;
- Monitor and evaluate the implementation of the specific pro-poor interventions and recommend new/revised policies to suit evolving requirements and necessary improvements.

- Enhance resource mobilization through partnering with existing livelihood programs and expanding the coverage of FRESA to productive use of RE projects in other outer islands.
- Promote, design the mechanics of, and implement decentralized energy programmes.
- Build on the activities carried out under RETDAP that deal with RE resource assessments and assessments of technical and logistical requirements of feasible RET applications;
- Conduct annual monitoring of energy (RE and non-RE) projects in the country and documentation of each project’s profile, performance and results;
- Disseminate and exchange information materials on the monitored energy projects, as well as similar applicable projects implemented elsewhere.

- Conduct continuous renewable energy resource (wind, solar, biomass, landfill gas, etc.) surveys in selected areas in the country where there are renewable energy resource potentials;
- Assess the technical requirements of wind and solar technology applications (e.g. measurements of wind velocities and solar radiation intensities) and other relevant RET applications.
**THE CHALLENGES**

Access to commercial sources of energy (LPG, diesel, etc.) and 24-hour electricity supply is geographically skewed.

Inadequate technical capacities to manage rural energy efficiently (e.g., suppliers at the local level lack adequate technical capacities to maintain and operate 24-hour power plants and also lack frameworks for incorporating modern and cleaner energy sources).

Lack of awareness about renewable energy, its applications, potential and success stories contribute to the indifference towards its adoption.

**MEETING THE CHALLENGES**

Assess the feasibility of direct importation of commercial energy forms (e.g., remove STO monopoly on petroleum fuel imports) by the private sector and the feasibility of IPP’s and IDC’s with experiences in renewable energy and enhanced technical capacities to operate in the outer islands.

Assess the feasibility of alternative energy technologies (e.g., RETs, EE appliances); Promote the use of applicable EE appliances (for households and small industries); Conduct awareness-raising programme in the widespread practice of the efficient, effective and wise use of commercial energy forms.

Assess (1) capacity development needs of rural communities, (2) existing potential of modern/cleaner energy sources in existing rural energy infrastructures, (3) requirements and support needed for the potential applications and (4) how these can support the socio-economic development and livelihoods of rural people in the outer islands.

Expand the FRESA to cover financing for the purchase of EE appliances/equipment.

Make Environment Research Centre and Faculty of Engineering Technology certified centres for capacity-building on energy and poverty and enable them to train private entrepreneurs to operate and properly maintain improved energy systems employing modern/cleaner energy sources in rural communities for the benefit of productive activities.

Continue the information dissemination programmes initiated under RETDAP with emphasis on the (1) annual monitoring of RE-based energy projects or installations in the country; (2) documentation of the profiles of monitored projects/installations; (3) compilation of information materials on RETs that are applicable and feasible in the country; and (4) preparation and dissemination of abstracts and information notes on relevant articles about RETs.

Continue the Information Exchange Service that was set up under the RETDAP.
The current assistance for RE and EE projects targeted at the poor provides for an insubstantial portion of the costs.

Access Issues (cont'd)

Lack of entrepreneurship development support in the energy sector

Lack of energy entrepreneurship-related data for designing and establishing advanced capacity development programmes and, furthermore, for promoting energy entrepreneurship

The current assistance for RE and EE projects targeted at the poor provides for an insubstantial portion of the costs

Expand financing energy for the poor to cover hardware costs

A donor fund could be mobilized to support the Government’s energy initiatives targeted at the poor

Government to create a conducive environment through the enforcement of support policies and framework for encouraging entrepreneurship in the country’s energy sector and to establish clear policy on the role entrepreneurs can play in the country’s energy sector

Design and implement a programme to encourage and support entrepreneurship in the energy sector, particularly in the rural outer islands; Evaluate the implementation of an entrepreneurial support programme and recommend new/ revised policies to suit evolving requirements and necessary improvements

As part of the support framework, include and implement: (1) provision of capacity-building in the marketing of rural products; (2) creation of market for rural products

Assess the actual capacity of IPPs and IDCs in operating and maintaining power (RE-based and/or non-RE-based) generation units and distribution systems; Assess the operating performance of all power generation units and distribution systems in the country

Identify feasible measures to improve the performance (e.g., heat rates, load factors; availability) of existing power generation units, as well as the performance of the distribution systems (e.g., reduction of technical and non-technical losses)

Develop a programme for sustainable engagement of the local IPPs and IDCs that have relatively good performance in the operation of power generation systems that assist other IPPs and IDCs in the country; Conduct programmes for improving power generation performance and reducing loss in distribution systems in the outer islands.
**THE CHALLENGES**

- Shortage of available seed capital, allowing demand to surpass the funds available for disbursement; Dependence of high interest informal loans
- Access to energy project loans with collateral limits the financing from reaching a large segment of the rural population, especially women
- Stringent funding conditions restrict credit (e.g., for renewable energy development)

**MEETING THE CHALLENGES**

- Identify international donor agencies that can provide support to local banks for providing energy financing; Provide assistance to local banks in discussing, negotiating, and establishing funding for local energy project financing
- Tap international funding agencies for REF; Based on the evaluation of the performance of the FRESA, either expand it or establish a separate affordable and sustainable financing scheme
- Assess innovative financing modalities such as micro-credit without collateral but through instruments like group guarantees and WDCs; Review the performance of the RETDAP-established FRESA in this context
- Assess the financial capacity of entrepreneurs and energy consumers in rural communities
- Assess the loan/financing requirements of local banks; Design financing schemes which take into consideration the financial capacities of potential borrowers and requirements of funders
- Review impacts of policy recommendations on financing of RE projects under the RETDAP; Review of existing banking/financing policies regarding projects that they support; Promote the benefits and financial viability of RET applications for the provision of rural energy services to both government and private sectors (including banks/FIs)
- Study concerning various options for financing decentralized energy projects (RE-based in particular), including the potential financing entity for each; Development of the mechanics (including implementing rules and regulations, considering the requirements of the selected funding entity) for the most feasible, affordable and accessible scheme
- Formulate policies regarding financial incentives that can be potentially provided to support RE projects, based on, among other factors, RETDAP recommendations and performance evaluation of the FRESA; Develop and implement the rules and regulations for policies and framework in support of projects on the provision of rural energy services
- Set up a donor fund to support government subsidies for the poor
- Implement feasible financing schemes (e.g., FRESA or a modified/expanded version of FRESA)
Gender Concerns: WDCs do not have sufficient capacities to integrate and effectively represent gender perspectives on energy. Ministry of Gender and Family to collaborate with MOAD, MEEW, etc. to mainstream gender-related energy issues. Analyse gender issues as a whole and promote pro-women interventions to increase the use of relevant technologies, such as improved cook stoves, and to increase their productivity.

Monitoring and Evaluation (M&E) Framework: Poor data collection, documentation and M&E mechanisms. Develop appropriate benchmarks for energy and poverty. In addition to the established Energy Balance, develop an EMRS, that includes support policy, mechanics and implementing rules and regulations. Assess regularly the EMRS data and process to establish sectoral energy supply and consumption data, as well as other specific data. Utilize the information from the EMRS for national, local and sectoral energy planning. Disseminate energy supply, demand and consumption data and profile's trends through the Information Centre's Information Exchange Service.
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The UNDP Regional Energy Programme for Poverty Reduction (REP-PoR) aims to affect broad-based interventions in the energy sector, focusing on Asia Pacific countries. The emphasis is on harnessing energy effectively to meet developmental targets laid out in the Millennium Development Goals. As a first step to achieve the objectives of REP-PoR, this publication reports on the Maldives’ energy sector and its linkages to poverty concerns, gaps therein, and modalities for overcoming the same. It aims to facilitate the inclusion of a strong energy component to the Maldives’ socio-economic development programmes.