

# UNIDO Initiative on Rural Energy for Productive Use



Access to energy for the rural poor through renewable energy generation and distribution



Sustainable industrial development: capacity building for local assembly/ manufacture of energy equipment



Sustainable industrial development: income generation through productive



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION  
economy environment employment

# UNIDO Initiative on Rural Energy for Productive Use

## **Brief description**

*Energy is a prerequisite for sustainable development and to fight poverty. Energy contributes directly or indirectly to the efforts to achieve the targets of the Millenium Declaration.*

*Two billion people (one third of the world's population) lack access to commercial energy. The vast majority of these people live in the rural areas of the poorest regions of the world. Therefore, the target group for UNIDO's "Rural Energy Strategy" are those parts of the population of developing countries that are either too poor, or too isolated to attract private sector energy-related investments.*

*Through its rural energy projects and programmes UNIDO promotes the productive (income generating) uses of energy for rural development (industrialization) and poverty alleviation. In addition, UNIDO's energy programmes cover capacity building activities related to renewable energy technology and the assembly and manufacture of energy equipment and structures in developing countries.*

*UNIDO would provide the following services in rural energy (renewables): TC project/ programme design, capacity development/ technology transfer, productive use and financing mechanisms:*

*UNIDO is a specialized agency and houses a wide range of technical skills and experience. The number of professionals directly assigned to energy in UNIDO is 15 and it is one of the highest among the UN organizations active in the area.*

*UNIDO's work on rural energy will benefit from being linked to several other of the service modules in an integrated fashion. In particular the service modules on SMEs, private sector development, investment promotion, cleaner production and transfer of environmentally sustainable technologies come to mind.*

*Through its various networks and centers such as Cleaner Production Centers, Investment Promotion Offices, etc. UNIDO is well connected to experts and relevant institutions in developed and developing countries. UNIDO's country offices provide field-level, on-the-spot interventions as and when required.*

## **1. Background and rationale**

### **1.1 Background**

Energy is a priority for UNIDO because it is a prerequisite for sustainable industrial development and increasing access to energy in rural areas is vital in the fight against poverty. Further, energy contributes to the efforts to achieve the sustainable development targets of the Millenium Declaration (please see: Part III, paragraphs 11-20 and Part IV, paragraphs 21-23)

Recent large international gatherings such as the Ninth Session of the Commission on Sustainable Development on Energy and Transport (New York, April 2001) and Third UN

Conference on Least Developed Countries (LDC-III, Brussels, May 2001) stressed the importance of energy for poverty alleviation and recommended action.

WSSD preparatory work indicates that energy in general and rural energy (or energy for the poor) in particular will receive considerable attention at the summit.

## **1.2 The problem**

Two billion people (one third of the world's population) lack access to commercial energy. The vast majority of these people live in the rural areas of the poorest regions of the world.

In the rural environment, energy is needed for:

- Meeting the basic needs such as cooking, drawing water, heating, illuminating; and
- Generating jobs and income on and off the farm.

Providing energy services to rural areas requires:

- Organizing and securing the supply of energy for basic needs (LPG, CNG, biomass-based energy, and other renewable energy sources) and
- Generating and distributing "clean" electricity (grid and off-grid.)

Technology options for the above are known and well-explored. Therefore, the real challenge is the "packaging" of rural energy programmes, that is, combining components such as capacity building, technology transfer, training, financing, costing, increasing the income level of rural people, maintaining and repairing, etc.

The solution of the "energy problem" in the rural areas is a necessary condition for sustainable development. The benefits to be gained are many: economic (productive uses, job creation, income generation), social and health (basic needs, communication, health services, improvement of status of women), environmental (indoor air quality, local and global pollution and climate change), etc.

## **2. The UNIDO solution – objectives and conceptual approach**

### **2.1 UNIDO's energy programme**

UNIDO aims to help its clients in developing countries to solve two fundamental problems by de-linking economic growth and increased use of energy and by reducing the environmental damage that occurs with expanded energy use. UNIDO's overall work on energy has two components:

- Development of technical cooperation projects and programmes and
- Carrying out global forum activities, including the preparation of studies and organizing international conferences to discuss the pertinent issues of the sector.

Technical cooperation projects and programs formulate energy policies aiming at reducing green house gases (GHG) and therefore climate change; increase energy efficiency on both the supply and demand side, and promote the application of renewable (alternative) energies.

In its resolution GS.9/Res.1, entitled “Medium-Term Programme Framework, 2002-2005, the General Conference emphasizes UNIDO’s mandate in the area of energy for sustainable development and urges to devote particular attention to “giving special emphasis to initiatives, in coordination with other relevant actors and stakeholders, providing access to modern and efficient energy services for the poorest, with the goal of contributing to the international development targets” (para. 3, B, (e)).

## 2.2 UNIDO’s approach to “Rural Energy”

Within UNIDO’s energy programme, major attention is focused on rural energy needs for development. UNIDO’s competence and potential in this area has been recognized within the UN System and for the Third UN Conference on Least Developed Countries, LDC III, UNIDO was the Lead Agency for the Special Energy Session. As a result of LDC III, UNIDO is developing programmes that address the International Development Target to halve the number of people living in extreme poverty by 2015 with special emphasis on renewable energy for the poor.

The target groups for UNIDO’s “Rural Energy Strategy” are those parts of the population of developing countries that are either too poor, or too isolated to attract private sector energy-related investments. UNIDO also addresses the “rural energy” issue in the countries with economies in transition. Some of those countries, UNIDO has already identified large areas of populated land that are not connected to any grid system. Recent examples of UNIDO projects designed for such areas are “Off-grid wind energy project” in Romania and “Rural geothermal heat and power project” in Tomsk Region of the Russian Federation.

In defining its target group and its approach to rural energy, UNIDO is in full agreement with the intergovernmental consensus that enhanced international cooperation is needed to bring energy services to those currently without access to modern energy. These un-served populations are not attracting private sector activity, since they do not constitute a market that can generate adequate return on investment. There is global consensus that international cooperation, strong national commitments and public funding are initially needed to build basic energy service delivery structures. UNIDO is committed to fashion its cooperation projects so as to facilitate the “take-over” by the private sector at the earliest possible stage of market development. UNIDO is of the view that once viable energy markets have emerged, international organizations should not falsify the private sector competition.

It is equally understood and has been demonstrated through programs on every continent that – while the very poor cannot afford the up-front costs of energy-related installations – they are capable and willing to pay for energy services. UNIDO therefore makes a point of doing energy cooperation in such a way as to promote income generation and productive uses so that the poor can better afford the energy services they desire.

Through its rural energy projects and programmes UNIDO promotes the **productive (income generating) uses** of energy for rural development (industrialization) and poverty alleviation. In addition, UNIDO’s energy programmes cover **capacity building** activities related to renewable energy technology and the assembly and manufacture of energy equipment and structures in developing countries.

UNIDO’s energy programs would work with the **renewable sources of energy** (solar, mini-hydro, wind, biomass) most suitable to a given situation, taking into account the natural endowment of a region, the development priorities of the national government and the

suitability of different energy sources for different applications. An interesting application of PV solar energy to information and communication technologies (ICTs) for rural areas is described below. A mini-hydro power plant is planned for rural areas with water resources in Mali. A biomass energy project has been designed in Tanzania to convert the harmful waste of sisal plant processors to biogas. In Indonesia, UNIDO implemented a micro-wind energy project aiming at local manufacture of an appropriate wind mill.

An important programme component is renewable powered information and communication technologies (ICTs) for rural areas. Power supply is a precondition for the operation of ICTs and is therefore not possible in areas without electricity. ICTs offer major opportunities for economic development and income generation in rural areas as well as many social benefits. These programmes based upon solar energy systems are particularly appropriate for Sub Saharan African countries and rural areas of many Asian countries.

In a summarized fashion UNIDO would provide the following services in rural energy (renewables):

- TC Project/programme design:
  - o Market surveys
  - o Energy/development needs assessments
  - o Formulation of strategies or discrete projects
- Capacity development/technology transfer:
  - o Technical capacity building/technology transfer to promote local assembly/manufacture of energy equipment;
  - o Installation, operation and maintenance of energy generation, transmission and distribution system
- Productive use:
  - o Promoting rural entrepreneurs to establish and run rural energy businesses
  - o Packaging energy projects together with the creation of income generation activities for the local population;
- Financing mechanisms:
  - o Investment promotion
  - o Micro-financing.

The various steps are discussed more in detail below (sections 2.3 to 2.6). UNIDO's initiative on energy for sustainable development for SIDS constitutes a particular application of UNIDO's general approach to rural energy.

### **2.3 TC Project/programme design**

The design of a TC project/program in rural energy may start with a **market survey, identifying (potential) energy users**. UNIDO's aim in a market survey is to develop industrial activities in the region/country in question.

In a subsequent phase and in the light of the results of the market survey and the priorities of the program country, UNIDO would offer its impartial advisory services in the context of an **energy needs assessment**; unlike a TNC, UNIDO would concentrate its assessment on the requirements of the (very) poor areas.

UNIDO would assist requesting countries in elaborating national rural energy development strategies. This activity would include the **formulation** of the strategy (or of a discrete project), discussions in multi-stake-holder settings and identification of national and international partners.

## 2.4 Capacity development/technology transfer

UNIDO's core mandate is to develop the productive capacity of developing countries in manufacturing through technology transfer and investment promotion. In its approach to rural energy, UNIDO brings this expertise (which is unique in the UN system) to the local manufacture of energy equipment and energy generation, transmission and distribution systems. This is a role for which UNIDO's comparative advantage is explicitly recognized by other players in international energy cooperation.

It is generally known that one of the main barriers to the increased use of renewables in developing countries is their costliness. One way of bringing down costs, would be to **manufacture (or assemble) larger volumes of renewable energy equipment** in developing countries. UNIDO would therefore assist developing countries in the establishment and initial operation of local assembly/manufacture of energy equipment. UNIDO considers it essential to get the private sector involved early on in such projects and will seek to package the projects in such a way as to make them feasible for private sector participation. To aim for long-term sustainability and commercial profitability is part and parcel of UNIDO's approach.

UNIDO also builds capacity and promotes technology transfer by assisting developing countries to **install, operate and maintain energy generation, transmission and distributions systems**. In very poor rural areas, stand-alone energy generating facilities using biomass, wind or mini-hydro with mini-grids are often the most viable options to meet the most basic energy needs. Care will be taken to structure the projects in such a way as to ensure to the highest possible degree the long-term economic viability of the projects, by factoring in productive uses for the generated energy that help to pay for energy services consumed.

UNIDO is mindful that there are also severe basic needs in energy-poor rural areas which might be best addressed through LPG. Given UNDP's LPG Challenge, UNIDO would not seek to meet these needs independently, but would aim at cooperating with UNDP's LPG Challenge to address them.

## 2.5 "Productive Use"

In its approach to rural energy, UNIDO would seek to maximize the benefits for the local energy clients by emphasizing the "productive use" dimension of programs and projects. This would mean to actively promote rural entrepreneurs to establish and run rural energy businesses. The development of rural energy entrepreneurs would stimulate the economic performance of the area, contribute to the development of SMEs, and build capacity for industrial development. Productive uses of energy include, among others, water pumping, purification; food processing; multifunctional platform (MFP); ICT application mentioned in 3.2 above, etc.

UNIDO would also seek to package its energy projects together with activities aimed at generating income for the local population (e.g. farmers gain additional income from growing energy crops; villagers gain income by performing fee-collection or simply operating the energy generation facility and/or providing the energy services, etc.)

## **2.6 Financing Mechanisms**

In order to arrive at viable energy service provision in poor areas, finding the appropriate financial package is of utmost importance. As pointed out above, the poor usually cannot afford to bear the up-front costs of energy installations. They are capable and willing, however, to pay for energy services rendered. The financial package has to reflect this fact by combining ODA, grant money and loans in a judicious mix. Various models of micro-financing will have to be adapted to the particular needs of a given program.

Particular emphasis will be placed on using ODA strategically, i.e. to leverage private investment.

## **3. The methodology**

### **3.1 Implementation modalities**

Annex 1 gives the details of two initiatives: rural energy and its special application to small island developing states (SIDS).

### **3.2 Cooperation with other partners**

In the context of its strengthened rural energy program, UNIDO will continue to seek to cooperate actively with other relevant partners.

The Global Environment Facility (GEF) will continue to be a very important partner and UNIDO will attempt to fully capitalize on its recently acquired new status as “executing agency with expanded opportunities.”

The two largest UNIDO projects in the energy sector (in India and China respectively) are GEF/UNDP-financed. UNIDO will draw on the close links between the two agencies to avoid overlap and maximize comparative advantage. As a new member of the UNDP-chaired UN Development Group (UNDG), UNIDO will endeavour to anchor rural energy considerations more solidly in country based cooperation frameworks, such as UN-DAFs and PRSPs.

UNIDO is cooperating with private sector companies in donor as well as recipient countries. Engineering/consulting companies such as Norplan, Verbundplan, and equipment manufacturers such as VA Tech, Ericsson, etc. Furthermore, E7 (association of 7 large northern utilities) and WEC (World Energy Council) have expressed interest in cooperating with UNIDO.

### **3.3 Funding strategy**

UNIDO utilizes GEF, UNDP, special-purpose contributions of donors and its own programmable technical cooperation funds to finance its energy projects. GEF is one of the largest funding sources for UNIDO executed projects and will continue to be so. It is to be recalled, however, that GEF is a funding mechanism of the UN Framework Convention of Climate Change and hence has a “GHG emissions-reduction/global environment”—and not primarily a developmental—perspective. Furthermore GEF requires co-financing. This co-financing can come from UNIDO’s own resources, from a bilateral donor, from a private enterprise, from the recipient country, or from a combination of them.

Presently, the costs of capacity building, training and technology transfer required for local manufacture of energy equipment and structures may not be fully financed by GEF. Furthermore, in order for rural energy projects to be viable in the long term, rural populations need to be able to afford the energy services they are purchasing. Hence the income generation component of rural energy projects becomes crucial. Such income-generation component is not fully fundable under the current GEF rules and strategies.

Therefore, a “UNIDO Trust Fund for Rural Energy” is proposed. It would be used to

- provide co-financing for GEF-projects;
- finance demonstration projects to show broader replicability and thereby enhancing the attractiveness of projects for private entrepreneurs;
- finance some elements of the capacity building, especially those with regional benefits (e.g. training courses for workers and engineers to be employed in the local manufacture/assembly of energy equipment; training courses for plant operators, etc.);
- finance the productive uses of energy for income generation;
- finance the activities to regionalize the successful national rural energy development project (e.g. by holding workshops to demonstrate the lessons learnt and demonstrate the replicability).

Special contributions for larger projects would continue to be sought from bilateral donors.

The European Commission is one of the most powerful actors in the international scene, both through the activities of the DG TREN in the internal market and through external relations activities. UNIDO will pursue the dialogue with DG TREN and seek opportunities for collaboration on concrete initiatives with appropriate EC units.

#### **4. Why UNIDO**

UNIDO is a specialized agency and houses a wide range of technical skills and experience. The number of professionals directly assigned to energy in UNIDO is 15 and it is one of the highest among the UN organizations active in the area.

UNIDO's work on rural energy will benefit from being linked to several other of the service modules in an integrated fashion. In particular the service modules on SMEs, private sector development, investment promotion, cleaner production and transfer of environmentally sustainable technologies come to mind.

UNIDO provides integrated project services, that is, from project identification and formulation to implementation, all of the required services such as project personnel recruitment, subcontracting, procurement of project equipment, etc. can be provided under one roof. This provides more effective monitoring and speeding up of operations.

Through its various networks and centers such as Cleaner Production Centers, Investment Promotion Offices, etc. UNIDO is well connected to experts and relevant institutions in developed and developing countries. UNIDO's country offices provide field-level, on-the-spot interventions as and when required.

## Annex 1

Typical UNIDO Rural Energy initiatives could have the following pattern:

### A. Pilot phase activities of UNIDO's Rural Energy initiative

- a) Assisting requesting countries in elaborating national rural energy development strategies. This activity will include the formulation of the strategy, discussions at the multi-stakeholder workshops, and identification of national and international partners

**Estimated cost per country: US\$ 200,000**

- b) Implementing demonstration projects that have some or all of the components listed below:

- Creation of renewable-based energy/electricity generation systems with total installed capacity of 10-100 kW, depending upon the source (solar, mini-hydro, wind, biomass);

AND/OR

- Carrying out special programmes such as coal and biomass briquettes for basic needs, multifunction platforms, rural transport, etc.

AND/OR

- Building capacities for local assembly/manufacture of energy equipment, technology transfer, etc.

AND/OR

- Making productive use of generated energy (irrigation, off-farm industries, etc.)

**Estimated cost per country: US\$ 900,000**

- c) The demonstration projects will be designed for replication on a wider scale through involvement of various partners (particularly the private sector). To this end, an investment promotion package will be prepared to show the economic and technical feasibility of the projects. The projects will then be presented to the interested parties through an awareness building campaign.

**Estimated cost per country US\$ 100,000**

**Total estimated total cost of pilot phase activities per country: US\$ 1,200,000**

Pilot phase can be implemented in the requesting countries from the following groups:

- LDCs (total number is 49 of which 35 are in Africa)
- Poverty stricken regions of large countries (China, India, Nigeria, Pakistan, ...)
- Special case of small islands and small island states.

## **B UNIDO Initiative on Productive Use of Clean Energy for Sustainable Development of Small Island Developing States (SIDS)**

Within UNIDO's emphasis on rural energy, SIDS constitute a special case worthy of particular attention.

Small Island Developing States (SIDS) are heavily dependent on fossil (petroleum) fuels and conventional biomass. The negative impacts on the environment and the heavy financial burden placed on SIDS through the present use of these fuels is the problem. The problem aggravates because of the low efficiency of energy use. Therefore, identification of the problem, formulation of national strategies, application of appropriate technologies and policies are required.

### **Activities of UNIDO's clean energy for SIDS programme**

The main objective of the programme will be to achieve energy self-sufficiency and to increase the use of available energy for productive activities. To achieve these targets, a three-phase programme is considered:

- a) Analyze demand and supply side energy data, consider development targets and identify needs, formulate policies and strategies
- b) Develop projects to submit to donors
- c) Implement demonstration projects

Phase I will include activities such as

- Collection, compiling and analysis of demand and supply side energy data;
- Analysis of projections of economic development in general and energy development in particular
- Preparation of an energy plan, including policies, strategies, deployment of clean energy technologies, use of energy to promote income generation.

**Estimated cost of Phase I per country is US\$ 50,000.**

Phase II will include activities such as

- Sectoral analysis and indicative needs identification: Selection of 2-3 sectors for each country such as: tourism, food (fish) processing, transport, electricity generation, electric motors, etc.
- Formulation of projects aiming at, among others:
  - Mini-grid replacement (re-powering fossil fuel based remote grids by renewable energies);
  - More efficient use of biomass
  - Providing information and communication technologies (ICT) to remote areas with renewable-powered telecenters
  - Local assembly/production of solar water heaters, particularly for urban areas and the growing tourism industry
  - Demand side management and more efficient end-use consumption of electricity
  - Improving the efficiency of present electricity generation, transmission and distribution networks
  - Implementing clean transport models (biofuels, electric vehicles, etc.)

**Estimated cost of Phase I per country is US\$ 50,000.**

**Estimated total cost of Phase I and II per country: US\$ 100,000**

Phase III: Implementation of demonstration pilot projects:

Two demonstration projects per country will be implemented. A maximum grant level of US\$ 200,000 per project is envisaged.

**Estimated cost of Phase III per country: US\$ 400,000**

**Total estimated total cost of all phases per country: US\$ 500,000**

This initiative could be implemented in all Small Island Developing States (SIDS).

## Annex 2

### A comparison of approaches of UNIDO and TNC in rural energy

	<b>Rural energy (access)</b>		
	<b>Activities</b>	<b>UNIDO</b>	<b>TNC</b>
<b>TC Project/ programme design</b>	-Market surveys	aims at developing industrial activities	Seeks to identify existing commercial market for own products and services
	-Energy/ development needs assessment	impartial advisory approach and full coverage of poor areas	business oriented approach, exclusion of low RoI areas
	-Formulation	OK	OK
<b>Capacity development/ technology transfer</b>	-Technical capacity building/ technology transfer to promote local assembly/ manufacture of energy equipment	aim and integral part of every project	implemented only when commercial conditions warrants it
	-Installation, operation and maintenance of energy generation, transmission and distribution system	implemented as a development objective of projects. Aims at using created capacities in replica projects	would make use of the capacity if it is created in the country by someone else
<b>Productive use</b>	-Promoting rural entrepreneurs to establish and run rural energy businesses -Packaging energy projects together with the creation of income generation activities for the local population	high priority for industrial development	priority is given to improve the feasibility of own operations
<b>Financing mechanisms</b>	-Investment promotion -Micro-financing	financing packages combining ODA, grant money and soft loans	financing is promoted/ provided contingent on adequate RoR
<b>Knowledge capture/ sharing</b>	UNIDO data bases, statistical information, global forum functions	experience, best practices, etc. are shared freely	commercial/ business information is kept confidential

TNCs have made it clear at various multi-stake holder meetings that they are not in a position to provide energy services to very poor populations since they cannot count on a commercial return on their investment. Even in emerging markets, TNCs welcome the activities of the international organizations aiming at capacity building, financing, etc.

### Annex 3

## MILLENNIUM DECLARATION TARGETS AND THE UNIDO ENERGY PROGRAMME (with additional reference to NEPAD-The New Partnership for Africa's Development)

*The original idea of matrix analysis of sustainable development targets and energy belongs to DFID (UK)*

MD target	Role of energy in achieving the MD target	Coverage by the UNIDO Energy Programme
<b>Development and poverty eradication (Part III, para. 19)</b>		
<p>?? To halve, by the year 2015, the proportion of the world's population whose income is less than one dollar a day.</p>	<p><b>Energy and social development:</b></p> <p>?? Energy is needed to meet the basic needs such as cooking, heating, illuminating</p> <p>?? Health, education and social activities require energy to operate refrigerators, pumps, ICT, transportation, etc.</p> <p><b>Energy for income generation:</b></p> <p>?? Farm sector needs energy for mechanization of irrigation, crops, animal husbandry, etc.</p> <p>?? Access to energy services promotes enterprise development in rural areas</p> <p>?? Off-farm light manufacturing generates more income if reliable energy is available for mechanization, illumination, etc.</p> <p>?? Local energy supplies can often be provided by small scale, locally owned businesses creating employment in local energy service provision and maintenance, fuel crops, etc.</p> <p>?? Clean, efficient fuels reduce the large share of household income spent on cooking, lighting and heating (there is an equity issue here - poor people often pay proportionately more for basic services in urban areas)</p>	<p>UNIDO's Energy Programme address issues such as:</p> <p>??Clean fuels for rural poor</p> <p>??Renewable-based mini-grid replacement reduces dependence on imported energy and reduce the cost of energy for the poor</p> <p>??Rural energy for income generation</p> <p>??Promotion of rural entrepreneurship around energy projects</p> <p>??Increasing the energy efficiency of rural enterprises improves their productivity and competitiveness</p> <p>??Efficient use of available energy opens up opportunities for employment and income generation.</p>
<p>?? To halve, by the year 2015, the proportion of the world's people who suffer from hunger</p>	<p>?? Mechanization of agriculture using power equipment increases the farm productivity and provides more food.</p> <p>?? Most of staple foods (grains, roots, etc.) need cooking and mainly in water.</p> <p>?? Energy for irrigation helps increase food production and access to nutrition.</p> <p>?? Clean water helps improve health. Increased health and nutrition opens up opportunities for employment and income generation.</p>	<p>??Farm energy projects</p> <p>??Multifunctional platform running on bio-diesel</p> <p>??Renewable-based rural energy schemes for irrigation and water purification</p> <p>??Local manufacture of powered agricultural tools, pumps, hoses, pipes, and other related equipment</p> <p>??Direct solar water heating, drying, desalination, etc. projects</p>
<p>?? To halve, by the year 2015, the proportion of the world's people who are unable to reach or to afford safe drinking water.</p>	<p>?? Energy can be used to pump and/or to purify water so that the water is made available and the time spent collecting and transporting it is reduced.</p>	<p>??Multifunctional platform running on bio-diesel and used, among others, to pump water</p> <p>??Renewable-based rural energy schemes for irrigation and water purification</p> <p>??Local manufacture of pumps, hoses, pipes, and other related equipment</p> <p>??Direct solar water heating, drying, desalination, etc. projects</p>

MD target	Role of energy in achieving the MD target	Coverage by the UNIDO Energy Programme
<b>Universal primary education (Part III, para. 19)</b>		
?? To ensure that, by the year 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.	<p>?? Availability of modern energy services frees children's and especially, girl's time from helping with basic needs related activities (collecting fuelwood, water, manually pounding grains, time-consuming and inefficient cooking, etc.)</p> <p>?? Electric lighting permits evening study at home or evening classes</p> <p>?? Electricity enables access to ICTs that increase the quality and extent of education opportunities.</p>	<p>??Renewable energy-based ICT systems</p> <p>??Rural energy projects to meet the basic needs (cooking, heating, etc.)</p> <p>??Rural mini-grids</p>
<b>Gender equality and women's empowerment (Part III, para. 20)</b>		
?? To promote gender equality and the empowerment of women is effective ways to combat poverty, hunger and disease and to stimulate development that is truly sustainable.	<p>?? Availability of modern energy services frees children's and especially, girl's time from helping with basic needs related activities (collecting fuelwood, water, manually pounding grains, time-consuming and inefficient cooking, etc.)</p> <p>?? Lighting in schools allows evening classes (particularly for women)</p> <p>?? Street lighting improves women's safety</p> <p>?? Reliable energy services offer scope for women's enterprises</p>	<p>??Rural energy projects to meet the basic needs (cooking, heating, etc.)</p> <p>??Rural mini-grids</p> <p>??Multifunctional platform managed by women</p> <p>??Productive use of energy by woman entrepreneurs (job and income generation)</p>
<b>Child Mortality (Part III, para. 19)</b>		
?? By 2015, to have reduced under-five child mortality by two thirds, of its current rate.	<p>?? Indoor air pollution from traditional fuels causes significant numbers of premature deaths amongst children under 5 years old.</p> <p>?? Gathering and preparing traditional fuels exposes young children to health risks and reduces time spent on childcare and education.</p> <p>?? Modern energy can be safer (less burns, accidents and house fires)</p> <p>?? Electricity enables pumped clean water and purification</p> <p>?? Refrigeration allows access to vaccinations.</p> <p>?? Provision of nutritious cooked food, space heating and boiled water contribute towards better health and all need energy.</p>	<p>??Rural energy for basic needs programmes</p> <p>??Renewable-based rural energy schemes for irrigation and water purification</p> <p>??Charcoal and coal briquetting projects</p> <p>??Local manufacture of LPG bottles, burners and associated components</p>
<b>Maternal health (Part III, para. 19)</b>		
?? By 2015, to have reduced maternal mortality by three quarters of its current rate.	<p>?? Indoor air pollution from traditional fuels and carrying of heavy loads (fuelwood and water) contributes to poor health in women (respiratory infections, back and pelvic damage) making women less fit for child birth and at more risk to complications.</p> <p>?? Gathering preparing and using traditional fuels exposes women to health risks</p> <p>?? Energy services are needed to provide access to better medical facilities for maternal care including medicine refrigeration, sterilisation, electronic medical equipment and access to up to date medical information</p> <p>?? Provision of nutritious cooked food, space heating and boiled water contribute towards better health and all need energy</p>	<p>??Rural energy for basic needs programmes</p> <p>??Renewable-based rural energy schemes for irrigation and water purification</p> <p>??Charcoal and coal briquetting projects</p> <p>??Local manufacture of LPG bottles, burners and associated components</p>
<b>HIV/AIDS, malaria and other major diseases (Part III, para. 19)</b>		
?? To have, by 2015, halted and begun to reverse:	?? Energy/electricity for health services allows refrigerated storage of vaccines and medicines; allows the use of medical equipment both for	<p>??Renewable energy-based ICT systems</p> <p>??Rural energy projects to meet the basic needs (cooking, heating, etc.)</p>

MD target	Role of energy in achieving the MD target	Coverage by the UNIDO Energy Programme
<ul style="list-style-type: none"> <li>- the spread of HIV/AIDS</li> <li>- the scourge of malaria and other major diseases that afflict humanity.</li> </ul>	<p>laboratories and for hospital services such as sterilisation.</p> <p>?? Electricity enables access to ICT and allows health education as well as crisis management.</p>	<p>??Rural mini-grids</p>
<b>Environmental Sustainability (Part IV, para. 23)</b>		
<p>?? To make every effort to ensure the entry into force of the Kyoto Protocol.</p> <p>?? To intensify our collective efforts for the management, conservation and sustainable development of all types of forests.</p> <p>?? To press for the full implementation of the Convention on Biological Diversity<sup>8</sup> and the Convention to Combat Desertification</p> <p>?? To stop the unsustainable exploitation of water resources</p> <p>?? To intensify cooperation to reduce the number and effects of natural and manmade disasters.</p> <p>?? To ensure free access to information on the human genome sequence.</p>	<p>?? Traditional fuel use contributes to erosion, reduced soil fertility and desertification. This can become more sustainable through substitution, improved efficiency and energy crops</p> <p>?? Using cleaner, more efficient fuels will reduce GHG emissions</p> <p>?? Efficient use of energy helps to reduce local pollution and improve conditions for poor people</p>	<p>All of the activities of UNIDO energy programme contribute to environmental sustainability.</p>
<b>8) Meeting the special needs of Africa (Part VII, para. 28)</b>		
<p>?? To take special measures to address the challenges of poverty eradication and sustainable development in Africa, including ..., as well as transfers of technology.</p>	<p>?? Energy-related mining, transporting and generation activities involve a large number of technologies. Increased local participation in these activities is essential to improve the cost-effectiveness of the investments.</p> <p>?? Productive end use of energy also requires employment of a number of technologies.</p>	<p>??Rural energy projects aiming at maximizing local participation through local assembly and/or manufacture'</p> <p>??Development of income-generation activities at the demand side of the rural energy projects.</p>
<b>NEPAD ON ENERGY</b> <b>Part B. Sectoral priorities: Bridging the Infrastructure Gap (ii) Bridging the Digital Divide: Investing in ICT (iii) Energy (para 112 objectives and para 113 actions)}</b>		
<p>(selected) <b>Objectives:</b></p> <p>?? Energy plays a critical role in the development process, first as a domestic necessity but also as a factor of production</p>	<p><b>Actions:</b></p> <p>?? Establish an African Forum for Utility Regulation and establish regional regulatory associations;</p> <p>?? Establish a task force to recommend priorities and implementation strategies for regional projects, including hydropower generation,</p>	

MD target	Role of energy in achieving the MD target	Coverage by the UNIDO Energy Programme
<p>whose cost directly affects prices of other goods and services, and the competitiveness of enterprises. Given the uneven distribution of these resources on the continent, it is recommended that the search for abundant and cheap energy to focus on rationalising the territorial distribution of existing but unevenly allocated energy resources. Furthermore, Africa should strive to develop its solar energy resources which is abundantly available.</p> <p>?? To increase from 10 per cent to 35 per cent <i>or more</i>, access to reliable and affordable commercial energy supply by Africa's population in 20 years;</p> <p>?? To improve the reliability as well as lower the cost of energy supply to productive activities in order to enable economic growth of 6 per cent per annum;</p> <p>?? To reverse environmental degradation that are associated with the use of traditional fuels in rural areas;</p> <p>?? To exploit and develop the hydropower potential of river basins of Africa;</p> <p>?? To integrate transmission grids and gas pipelines so as to facilitate cross-border energy flows;</p> <p>?? To reform and harmonise petroleum regulations and legislation in the continent.</p>	<p>transmission grids and gas pipelines;</p> <p>?? Establish a task team to accelerate the development of energy supply to low-income housing;</p> <p>?? Broaden the scope of the programme for biomass energy conservation from the Southern African Development Community (SADC) to the rest of the continent.</p>	