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## **Energy for the Poor**

# consultation document

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# **Energy for the Poor**

## **Consultation Document**

Department for International Development  
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# Energy for the poor

*'To implement the goal accepted by the international community to halve the proportion of people living on less than one dollar per day by 2015, access to affordable energy services is a prerequisite.'*<sup>1</sup>

## 1. The Importance of Energy Access for the Poor

1.1 Energy can play a critical role in helping to achieve the Millennium Development Goals (MDGs) and improving the lives of poor people across the world. The wide range of 'energy services' – cooking, lighting, heating, water pumping, transport, etc. – made possible by fuels and fuel technologies can have a major impact in facilitating sustainable livelihoods, improving health and education and significantly reducing poverty. (Box 1 and Annex 1 describe the direct and indirect links between energy and the MDGs.) Conversely, energy poverty – the absence of sufficient choice in accessing adequate, affordable,

reliable, safe and environmentally benign energy services – can be a severe constraint on economic and human development.

1.2 In the light of the importance of energy services for poverty reduction, this paper proposes that development agencies and developing country governments should adopt a new approach to energy provision, one in which energy is, from the outset, fully integrated into all development plans. In the first instance, this means dispelling a number of misconceptions or myths about energy (see Box 2), as well as recognising energy as a service, not simply a sector. It is vital to repair the current disconnect between strategies in other sectors of the economy and understand more fully the requirement that all sectors have for energy services.

### Energy and the Millennium Development Goals

Box 1

Energy services can play a variety of direct and indirect roles in helping to achieve the MDGs:

*To halve extreme poverty* – access to energy services facilitates economic development – micro-enterprise, livelihood activities beyond daylight hours, locally owned businesses, which will create employment – and assists in bridging the 'digital divide'.

*To reduce hunger and improve access to safe drinking water* – energy services can improve access to pumped drinking water – clean water and cooked food reduce hunger (95% of food needs cooking).

*To reduce child and maternal mortality, and to reduce diseases* – energy is a key component of a functioning health system, for example, operating theatres, refrigeration of vaccines and other medicines, lighting, sterile equipment and transport to health clinics.

*To achieve universal primary education, and to promote gender equality and empowerment of women* – energy services reduce the time spent by women and children (especially girls) on basic survival activities (gathering firewood, fetching water, cooking, etc.); lighting permits home study, increases security and enables the use of educational media and communications in schools (including information and communication technologies, ICTs).

*Environmental sustainability* – improved energy services help to reduce emissions, protecting the local and global environment; efficient use of energy sources and good management can help to achieve sustainable use of natural resources and reduce deforestation.

<sup>1</sup> Commission on Sustainable Development, ninth session, Agenda Item 4, Decision, Energy for Sustainable Development, Section 6.22 (2001)

There are a number of misconceptions or myths about energy, which should be dispelled in order to encourage the development community to think more seriously about issues related to energy supply, energy access and energy use:

- *Myth* – poor people do not consider access to energy as a priority.
- *Reality* – the poor spend more time and effort obtaining energy services than the better off; and they spend a substantial proportion of their household income on energy just for basic human survival (cooking, keeping warm, etc.).
- *Myth* – access to grid electricity will solve all the energy service needs of the poor.
- *Reality* – people need access to other fuels for cooking and heating.
- *Myth* – the poor will not pay for energy services.
- *Reality* – poor people already pay more (per unit of energy and in payments demanded by corrupt management) than the better off.
- *Myth* – new technology (such as solar photovoltaics and fuel cells) can massively improve poor people's access to energy services.
- *Reality* – technology is rarely the constraint: addressing institutional, political and social problems is typically more important.
- *Myth* – only people in rural areas suffer from energy poverty.
- *Reality* – poor people in urban areas also suffer from energy poverty: the number of people in energy poverty in urban areas looks likely to increase as it is predicted that 61% of the world's population will be living in urban areas by 2025.<sup>2</sup>

1.3 The paper encourages an holistic approach to energy service provision, rather than a project-based approach. Considering energy as a service at both the local level – cooking, lighting, saving time, increasing choice, etc. – and the national level – allowing reduced government subsidies and national budget reallocation, providing a vehicle to tackle corruption, facilitating trade, etc. – encourages outcomes that benefit the poor. The paper also stresses the need for evidence-based policy, acknowledging the importance of understanding more fully the links between energy and poverty reduction, particularly the 'macro-micro' links between energy policy and the direct impact on the lives of poor people.

### *Energy and sustainable development*

1.4 Energy encompasses electricity, light, heat and mechanical power from a wide range of fuels – including fossil fuels and renewable energy sources such as solar power, wind power, hydro-power and biomass – and fuel technologies – from traditional

three stone fires to efficient, clean electricity systems. Demand for energy is a 'derived demand', meaning that at an individual or community level, people do not desire energy as such but rather the services it can provide – cooked food, pumped water, light to see after dark, space heating, radio, transport, telephone, vaccine refrigeration, reduced drudgery and time saved.

1.5 Equally, at a national level, energy services help to facilitate stable economic development, allow access to global markets, have an impact on the national and global environment and can affect national budget allocations. They are essential ingredients of all three pillars of sustainable development – economic, social and environmental. In the past, there has been greater emphasis on technical and economic issues and, more recently, on the environmental aspects of energy, with social concerns receiving less attention. But to maximise the benefits of access to energy, all three pillars must be considered in parallel.

<sup>2</sup> UNHCS (1999), 'An Urbanising World, Global Report on Human Settlements' (referenced in DFID's second white paper).

- 1.6 Energy supports economic development at the national level by underpinning industrial growth, which in turn encourages job creation and income generation. But while there is clearly a strong relationship between growth in energy use and national income, the causal connection does work both ways, with richer countries using more energy as well as greater energy use supporting higher incomes.
- 1.7 Energy facilitates economic development at the local level by improving productivity and enabling local income generation through improved agricultural development (water pumping, crop processing, storage and transport to market) and through non-farm employment, including micro-enterprise development. As an indicator of local recognition of the importance of energy, Ugandan manufacturers who were asked to rank the constraints on their firms' activities identified power breakdown and voltage fluctuations as their top two problems.<sup>3</sup>
- 1.8 Energy also supports social development. There is a strong correlation between energy consumption and the Human Development Index, which measures life expectancy and educational achievement as well as income.<sup>4</sup> And energy is important for basic survival activities: for example, approximately 95% of staple foods (such as rice, grains and green bananas) need cooking before they can be eaten.
- 1.9 Of course, energy use also affects the environment and this impact can be negative. Emissions from fossil fuels, for example, reach beyond the local and national levels to affect the global environment. And the poorest people frequently live in the most vulnerable physical locations - precisely those places most affected by the increased frequency and extremity of future climate conditions. The poor may also face difficult trade-offs: in the words of a resident of Ha Tinh, Vietnam, *'We know that cutting down trees will cause water shortages and that making charcoal can cause forest fires, but we have no choice. Because we lack food, we have to exploit the forest.'*<sup>5</sup>
- 1.10 The World Commission on Dams highlights the fact that hydro-power from dams has made a significant contribution to economic development, but that there

have often been unacceptably high prices to pay with respect to environmental and social outcomes. Such imbalances can be addressed by learning from the past and ensuring that stakeholders are brought together to negotiate outcomes that are more equitable and transparent. Efficient supply and use of fossil fuels, combined with cleaner technologies, can help reduce the environmental effects of energy use. At the same time, careful management of energy resources such as forests for fuelwood and water for hydro-power is important to promote economic growth, protect ecosystems and provide sustainable natural resources.<sup>6</sup>

## 2. Energy Services and Energy Poverty: The Impact on People's Lives

- 2.1 All people are dependent on energy and the services that it provides in the interacting activities that sustain livelihoods. Indeed, equality of access to energy, like access to water, could be considered a basic human right. The rights-based development agenda highlights inclusion and accountability for services, and in this context, energy is important to the empowerment, and inclusion, of women in particular. For example, a World Bank study in China found that lack of access to electricity made people and communities feel excluded.<sup>7</sup> *[add more text on energy access as a right]*
- 2.2 Energy interacts with people's lives in many different ways - from the basic survival activities to increasing productivity by extending the working day with lighting and by mechanisation for irrigation and processing crops and raw materials. When communities gain access to energy services, it can have a marked effect on their lives, particularly with respect to freeing up their time, improving their health and well-being and opening up opportunities.
- 2.3 Access to energy services can reduce the amount of time that women and girls spend on survival activities, allowing them more flexibility to choose how they spend their time, whether tending to their children or in education, income generating activities or leisure pursuits. Patterns of time use typical of South Indian villages illustrate the impact of the absence of energy services. Typical families spend 2-6 hours each day

<sup>3</sup> Booth, Hanmer and Lovell (2000), 'Poverty and Transport', a report prepared for the World Bank in collaboration with DFID, ODI London (taken from the Willoughby Infrastructure and pro-poor growth paper).

<sup>4</sup> World Bank Energy Renewal Strategy 2001.

<sup>5</sup> Voices of the Poor, Volume 2, p50.

<sup>6</sup> 'Dams and Development. A New Framework for Decision-making', The Report of the World Commission on Dams, November 2000, Earthscan, London.

<sup>7</sup> Reference to the World Bank study carried out by IDS to be added.

collecting 10 kilograms of wood over distances of 4–8 kilometres. They also spend 1.5 hours a day fetching water over distances of 1.6 kilometres, and even then, the water collected is only enough for per capita consumption at the very low rate of 1.7 litres per day.<sup>8</sup>

- 2.4 Access to energy services can also affect people's health by providing access to better medical facilities (such as vaccine and medicine refrigerators), reducing the heavy loads that they have to carry (fuelwood and water) and reducing indoor air pollution from open fires. World Health Organisation figures indicate that 20% of the 10.9 million deaths of children under five years old in 1999 were due to acute respiratory infections (ARI). Although the extent to which smoke from cooking contributes to ARI is not yet clear, it is generally accepted that there is a link between indoor air pollution and ARI in children.
- 2.5 Energy is also important in facilitating access to health care via transport to health clinics. Fast access to medical services is important for the health and well-being of both mother and child when there are complications during childbirth. Emergency obstetric care also requires energy for functioning operating theatres and to refrigerate obstetric drugs. A voice from Togo suggests the impact of lack of access to energy for transport: *'We are all poor here, because we have no school and no health centre. If a woman has difficulty delivering, a traditional cloth is tied between two sticks and we carry her for seven kilometres to the health centre. You know how long it takes to walk like that? There is nobody who can help here, that's why we are all poor here.'*<sup>9</sup>
- 2.6 Energy for lighting allows study at night and facilitates access to learning materials through radio and other ICTs. There are at least 1.2 billion people in the world who cannot read and write, with the number of women far exceeding the number of men. Literacy can improve people's employment prospects, enabling them to increase household income.

- 2.7 Access to energy services also opens up opportunities for income generating activities, access to markets through transport and communications, and thus a way out of poverty. An example of the importance of energy comes from West Africa, where fish processing and trading at the artisan level provide diversified employment opportunities, especially for women in fishing communities. In a group discussion workshop, participants reflected on barriers to fish processing and trade. Overall, a significant number of problems raised by the participants related to energy, particularly in terms of processing. These problems highlight the interconnected nature of livelihood needs related to energy. The workshop identified the need to have a reliable power supply at processing sites, to promote appropriate technology for greater fuel efficiency in ways that reduce the health hazards of smoke which were identified by women processors, and to facilitate access to land to be managed by women processors as woodlots for fuel supplies.<sup>10</sup>

#### ***The energy dimension of poverty***

- 2.8 The number of people in energy poverty is staggering: two billion people lack clean, safe cooking fuels and must depend on traditional biomass sources; and 1.7 billion are without electricity. Increased access to such services will not, in itself, result in economic or social development. But a lack of adequate energy inputs can be a severe constraint on development.<sup>11</sup>
- 2.9 In 1997, the OECD countries consumed 54% of commercial primary energy compared with 12% in transition countries, 11% in China and 23% in other developing countries.<sup>12</sup> This means that slightly more than one billion people in industrialised countries consume about 54% of total commercial energy supply and around five billion people in transition and developing countries consume the remaining 46%. In practice, per capita energy use in Africa has barely increased since 1970 and is less than 10% of that in North America.<sup>13</sup>

<sup>8</sup> ASTRA 1982, references in World Energy Assessment 2000, Ch2, p52.

<sup>9</sup> Voices of the Poor Volume 1, p189.

<sup>10</sup> Workshop report, event organised by ICFS (International Collective in Support of Fishworkers), CNPS (Collectif National des Pecheurs Artisanaux du Senegal), CREDETIP (Centre de Recherches pour le Developpement des Technologies Intermediaires de Peche, with the support of FAO-DFID Sustainable Fisheries Livelihood Project (SFLP), [www.fao.org/fi/projects/sflp/index.html](http://www.fao.org/fi/projects/sflp/index.html)

<sup>11</sup> World Energy Assessment (2000). Chapter 2, Energy and Social Issues, edited by Amulya Reddy (India), published by UNDP, UNDESA, WEC.

<sup>12</sup> World Energy Outlook 2000, IEA.

<sup>13</sup> World Energy Assessment (2000).



2.10 To meet the basic cooking needs of the two billion people not served by modern fuels (which are as low as 0.1kW per capita on average) would correspond to no more than 1% of global commercial energy consumption.<sup>14</sup> This figure should be achievable, especially if lessons are drawn from the past. A flexible approach that recognises that ‘one solution does not fit all’ should have greater success in providing energy services to meet people’s needs.

2.11 One mistake of the recent past has been excessive focus on the provision of electricity to poor people rather than wider energy services. Electricity is not always the most appropriate form of energy, nor is it the quickest or most cost-effective way of providing energy services to poor people. For example, extending an electricity grid to households in rural areas can cost seven times more than for grid electricity in urban areas.<sup>15</sup> In most of sub-Saharan Africa, less than 10% of the population is connected to electricity and relies on fuelwood. And it is estimated that it would take over 250 years to supply all households in Uganda with electricity at current rates of electrification.<sup>16</sup>

2.12 Given the importance of energy in facilitating poverty eradication, why are there still so many poor people without access to appropriate energy services to help them out of poverty and improve their quality of life? There are several fundamental issues that need to be addressed before poor people have better access to sustainable energy services (and they are discussed in the following three sections):

- Reducing the costs of energy services both to national governments and to the poor.
- Creating an enabling environment at the national level to encourage the provision of local level energy services to the poor; and enhancing local infrastructure, knowledge and skills to support the development of sustainable energy services.
- Integrating energy planning more fully into development plans, with a primary focus on people’s energy service requirements rather than installed energy capacity.

### **3. Getting Energy Services to the Poor: Reducing the Costs**

#### *Using locally available energy resources and clean technologies*

3.1 The fact that poor people spend a substantial proportion of their household income on energy services means that even small changes in the price of energy can make a big difference in pushing low-income households into or out of poverty.<sup>17</sup> Particularly in remote areas, switching fuels to locally available energy resources – such as charcoal and hydro-power and other renewable energy resources – can reduce costs to the poor by reducing transport costs. Building the local capacity to develop and manufacture energy technologies also offers the possibility of bringing down the costs of energy services to the poor.

3.2 The poor could benefit from lower energy costs if new clean energy technologies were to be encouraged world-wide. Larger volumes of manufacture benefit from economies of scale, which would bring down technology costs. In order to warrant increased volumes of manufacture, the demand for these new technologies needs to be increased. The G8 Renewable Energy Task Force recognises that the fastest way to increase demand and deployment of the renewable energy technologies is to increase their use in industrialised countries, thus bringing down the costs and making them more affordable for developing countries. Setting targets for increased deployment of new clean technologies in industrialised countries can help to encourage their uptake.

#### *Privatisation and restructuring*

3.3 Developing country governments can also play a major role in reducing costs, notably through privatising and restructuring their national energy producers. Poor management of electricity utilities can be a huge drain on state funds. Efficiently run utilities facilitate budgetary reform by freeing up money for alternative investment, including in the social sector in medical facilities and schools. In addition, privatisation and restructuring can lead to a wider choice of energy services on offer to businesses and households.

<sup>14</sup> Reddy (1999), quoted in the World Energy Assessment, 2000.

<sup>15</sup> World Energy Assessment (2000).

<sup>16</sup> Arun Sanghvi, 2002, at a presentation in Copenhagen.

<sup>17</sup> Future Energy Solutions (March 2002) Draft Report, DFID KaR project R7661, ‘Energy, Poverty and Sustainable Urban Livelihoods’.

- 3.4 In 1992, total government subsidies for energy in developing countries were estimated at over US \$50 billion<sup>18</sup> – more than the total official development assistance these countries received. The government of the Indian State of Andhra Pradesh, for example, was paying subsidies of \$600 million a year to the electricity board prior to power sector reform. The Indian State Minister for Power says that state electricity boards lose around 92 paises (or about 1 US cent) per kWh. Indian electricity sales were about 450 billion kWh in 2000, so the gap between cost and tariff could be \$9 billion a year – enough to eliminate hunger from India.<sup>19</sup>
- 3.5 Despite widespread acceptance of the need for power sector reform, a survey of 115 developing countries in 1998 showed that the power sector is still dominated by state-owned monopolies. What is more, the survey concluded, ‘reforms have made little impact in improving energy services to the poor. They have focused on networks serving better-off users, generally neglecting institutional and market constraints to serving the poor.’<sup>20</sup> This underscores the difficulties involved in providing high quality energy to the poor and strengthens the case that policy-makers should also focus on creating better and sustainable conditions for the supply of traditional fuels, at least in the short run.<sup>21</sup>
- 3.6 Grid extension programmes in the past have been shown to be very costly and uneconomic. Privatisation has helped to reveal the true cost of such activities. Stand alone systems and mini grids were for a long time seen as competition by the utilities. But they are now beginning to recognise that they are complementary to the main grid, and can in many rural areas provide a cheaper and more reliable electricity supply.
- 3.7 Partnerships are an effective way of attracting investment to the energy sector and getting buy-in and commitment to providing energy services from a range of key players. Public-private partnerships are becoming more common. Partnerships including civil society are also beginning to emerge and show promising results.
- 3.8 In many cases, privatisation can lead to a decrease in price through competition among service providers or if old generating technologies are replaced with newer more efficient systems. For example, analysis of the performance of the Côte d’Ivoire electricity company, which was privatised in 1990, indicates that productivity gains were largely passed on to the consumers in price reductions.<sup>22</sup> And in Argentina, the average retail price of electricity for residential customers (net of taxes) dropped from an average of US \$0.19 per kWh (at constant 1997 prices) before 1991 to less than US \$0.12 per kWh five years after privatisation. The decrease was mainly a result of new power generators coming on stream in a competitive environment: the total number of generators increased from 13 in 1992 to 44 in 1997.<sup>23</sup>
- 3.9 Power sector reform can result in an increase in electricity prices if supplies were heavily subsidised prior to privatisation. But reform should lead to a more sustainable power sector and targeted subsidies can be used to assist the poor. What is more, reform prevents the better off who enjoy access to electricity being subsidised by the rest of the population. In Uganda, for example, 94% of the population were effectively subsidising the 6% who had access to electricity in the sum of \$50 million a year.<sup>24</sup>

#### *Pro-poor subsidies*

- 3.10 How can subsidies be best designed so as to benefit the poor? A subsidy that is currently used in many

<sup>18</sup> Goldemberg, J., and T.B. Johansson (1995), ‘Overview: Energy as an Instrument for Socio-economic Development’, in J. Goldemberg and T.B. Johansson (eds), *Energy as an Instrument for Socio-economic Development*, New York, United Nations Development Programme.

<sup>19</sup> Nickhil Desai, World Bank

<sup>20</sup> Brook, P.J. and J. Besant-Jones (2000), ‘Reaching the Poor in the Age of Energy Reform’, in ESMAP, *Energy Services for the World Poor*, Energy and Development Report 2000, World Bank, Washington DC/

<sup>21</sup> Kedebe, Bereket (March 2002), ‘Poverty, Energy and the Millennium Development Targets’, Centre for the Study of African Economics, St Antony’s College, Oxford University.

<sup>22</sup> Plane (1999), *Privatisation, Technical Efficiency and Welfare Consequences: the case of the Côte d’Ivoire Electricity company (CIE)*, World Development 27, 343-60.

<sup>23</sup> Estache, Foster and Wodon (2001), *Infrastructure Reform and the Poor: Learning from Latin America’s Experience*, paper presented at a conference ‘Infrastructure Reform for Latin America’, World Bank and Banco Nacional de Desenvolvimento Economico y Social, Rio de Janeiro.

<sup>24</sup> World Bank Project Appraisal Reports – full reference to be added

developing countries is the lifeline tariff for electricity, through which consumers enjoy a subsidised tariff rate for consumption below a 'lifeline' level. But two major problems in the implementation of lifeline tariffs have cropped up:

- First, many countries set the lifeline rate at relatively high consumption levels. For example, in Yemen the lifeline rate was at a consumption level that covers more than 75% of the customers, obviously implying a lot of leakage to the non-poor.<sup>25</sup>
- Second, even those consuming more than the lifeline level pay the lifeline rate for the initial electricity used. This can be corrected by having higher and lower rates up to the lifeline level of consumption, where those using more than the lifeline are obliged to pay the higher rate. Since reverting to the higher rate will create a jump in electricity bills at the lifeline level, a smoothing mechanism can be introduced.<sup>26</sup>

3.11 Connection tariffs can in some cases cause poor people to pay more for their electricity. For example, in Ghana, domestic connection charges are too high for households to afford one each, so several households share a connection. This pushes the amount of electricity used per meter from the domestic charging rates up into the commercial charging rates, as the use per meter is high. The poor households thus pay commercial rates for their electricity, which they can barely afford.<sup>27</sup>

3.12 Increases in electricity tariffs may also affect the poor by increasing the demand for other fuels that are substitutes for electricity. This increased demand can raise the prices of the biomass fuels that are important in the energy consumption of poor households. Similarly, in countries where petroleum products are taxed (such as Burkina Faso, Haiti and Mauritania), wood and charcoal prices are very high.<sup>28</sup> Hence, taxing the rich may hurt the poor and policy-makers

must understand these possible effects.<sup>29</sup> It is important for governments to work with both rich and poor to ensure a more equitable service.

3.13 It is also vital to understand more fully the 'macro-micro links' between policy and how it affects poor people in practice. Changes in taxes and subsidies can have unexpected indirect effects. For example, in East Timor, a reduction in the kerosene fuel subsidy resulted in deforestation as poor people were no longer able to afford kerosene and turned to fuelwood, putting pressure on resources.

3.14 Many subsidies in developing countries suffer from poor targeting because of their blanket nature. For example, in urban areas of Ethiopia in 1996, around 86% of the subsidies on kerosene were captured by the non-poor, since consumption of kerosene increases with income.<sup>30</sup> Blanket subsidies always benefit the elite more than the poor, as they use more energy than the poor – as a voice from Kenya comments: *'When the poor and rich compete for services, the rich will always get priority.'*<sup>31</sup> Smarter subsidies are transparent, targeted and pro-poor.

### **Reducing corruption**

3.15 Corruption at both a national and local level has a significant impact on poor people's access to energy and the prices they are obliged to pay. The poor already pay significantly more than the rich for energy services – for example, light by kerosene lamp costs 100 times more than from mains electricity; and power from a dry cell battery cost 10 times more than from mains electricity. What is more, where the poor are within reach of the grid but are prevented from having a legal connection, they often have to pay bribes to get access.

3.16 It is possible to bring down energy costs by reducing or removing corruption at the national and local level. Properly thought-out privatisation that makes the power sector more transparent and accountable has the

<sup>25</sup> Barnes and Halpern, 2000.

<sup>26</sup> Kebede, Bereket (March 2002), 'Poverty, Energy and the Millennium Development Targets', Centre for the Study of African Economics, St Antony's College, Oxford University.

<sup>27</sup> Future Energy Solutions (March 2002) Draft Report, DFID KaR project R7661, 'Energy, Poverty and Sustainable Urban Livelihoods'.

<sup>28</sup> Barnes, D. (1995), 'Consequences of Energy Policies for the Urban Poor', Energy Issues, FDP Energy Note No. 7, The World Bank, Washington DC.

<sup>29</sup> Kebede, Bereket (March 2002), 'Poverty, Energy and the Millennium Development Targets', Centre for the Study of African Economics, St Antony's College, Oxford University.

<sup>30</sup> Kebede, Bereket with Almaz Bekele and Elias Kedir (2001a), 'Affordability of Modern Fuels and Patterns of Energy Demand in Urban Ethiopia', final report in the 'Energy for the Urban Poor' Theme Group, African Energy Policy Research Network (AFREPREN), Nairobi, Kenya, December 2001.

<sup>31</sup> Voices of the Poor, Volume 1, p10.

potential to reduce corrupt practices. Good governance is needed to support the battle against corruption.

*[add examples of energy and corruption at local and national level; impact of encouraging adoption of good practice/institutional reform].*

#### **4. Getting Energy Services to the Poor: Creating an Enabling Environment**

4.1 What policies and institutional arrangements can make it easier for the poor to get access to energy services at reasonable cost? In many countries, the lack of legal status of poor people is a barrier to them having access to adequate energy services, even if they can afford to pay for them. For example, migrants that move to shanty towns are often not allowed to be connected to the grid as they are not legally registered. Governments may be reluctant to recognise shanty towns as legal dwellings since they are then obliged to provide them with water and other infrastructure services. For example, in China, rural households that move to urban areas do not have 'urban status' and are therefore, not allowed to be connected to power supplies.<sup>32</sup>

##### ***Regulation and standards***

4.2 With privatisation and restructuring of the power sector, the importance of regulation will increase. The main objective of regulation is to create a competitive environment in the power sector where cost savings are shared between suppliers and customers of electricity. The more this objective is fulfilled, the lower the electricity prices and the better the coverage and the greater the chance that the poor will be able to get access.

4.3 But the task of regulation is complicated, among other factors, by 'information asymmetries' (regulators do not have a precise picture of the costs of suppliers) and by the possibility that regulators can be captured by interest groups. Hence, regulation can be classified into

effective regulation – where the gains are diffused throughout the economy – and ineffective regulation – where the gains are retained by the shareholders or other small interest groups.<sup>33</sup> The chances of improving the supply of electricity to the poor increase with effective regulation.<sup>34</sup> But to date, there is little evidence that regulators are very concerned with providing access to poor people.

4.4 Alongside regulation, it is important to have standards. But if standards are set at levels too high for developing countries (say at the standard of industrialised countries), regulation by itself may become an obstacle to the expansion of fuels for the poor. Examples include construction standards for electricity and gas connections, land use and physical planning laws and regulations that prohibit the extension of services into informal neighbourhoods.<sup>35</sup> Relaxing some technical standards, without compromising on safety, can help increase the access of the poor to fuels.<sup>36</sup>

##### ***Incentives and access to finance***

4.5 Poor people on the whole have few affordable local energy options available to them. Incentives are needed to encourage private sector involvement in energy service provision, particularly incentives that are seen to reduce the risk of investment, such as guaranteed power purchase or favourable tariff structures. Incentives for energy efficiency are also important. For example, providing farmers with free electricity for irrigation does not promote efficient practices. If there were a small charge per unit of electricity used, or a graduated charging system so that rates go up with greater use, farmers would look more carefully at the amount of energy used. This may allow some additional capacity to be used for non-farm income generating activities in the rural communities.

<sup>32</sup> Future Energy Solutions (March 2002) Draft Report, DFID KaR project R7661, 'Energy, Poverty and Sustainable Urban Livelihoods'

<sup>33</sup> Price, C.W. (2000), 'Better Energy Services, Better Energy Sectors – And Links with the Poor', in ESMAP, Energy Services for the World Poor, Energy and Development Report 2000, World Bank, Washington DC.

<sup>34</sup> Kebede, Bereket (March 2002), 'Poverty, Energy and the Millennium Development Targets', Centre for the Study of African Economics, St Antony's College, Oxford University.

<sup>35</sup> Brook, P.J. and W.P. Smith (2000), 'Better Energy Services for the Poor', in ESMAP, Energy Services for the World Poor, Energy and Development Report 2000, World Bank, Washington DC.

<sup>36</sup> Kebede, Bereket (March 2002), 'Poverty, Energy and the Millennium Development Targets', Centre for the Study of African Economics, St Antony's College, Oxford University.

## Innovative Finance Mechanisms for Energy Provision

Box 3

- The African Rural Energy Enterprise Development (AREED) initiative, funded by the United Nations Environmental Programme (UNEP), seeks to develop sustainable energy enterprises that use clean, efficient and renewable energy technologies to meet the energy requirements of the poor. AREED provides enterprise development services to entrepreneurs and early-stage funding, in the form of debt and equity, to help build successful businesses that supply clean energy technologies and services to rural African customers.
- The Renewable Energy and Energy Efficiency Fund (REEF), which became operational in March 2002, was launched by the World Bank together with support from the Global Environment Facility (GEF) and several other private and public sector groups. It is the first global private equity fund devoted exclusively to investments in emerging market renewable energy and energy efficient projects.
- GEF funding for the Grameen Shakti organisation in 1998 enabled it to offer improved credit terms, increasing the payment period for solar home systems from one to three years. This had a significant effect on demand: between 1997-9, Grameen Shakti sold 1500 systems; in 2000, it installed 2000 to 2500 systems. Grameen Shakti believes that after three or four years of profitable growth, it will be able to obtain financing from commercial banks. Thus, use of GEF financing to support a high risk project, which is unable to attract commercial financing on its own, can result in significant growth and provide the means by which organisations can obtain commercial financing.

4.6 Many poor people would be able to pay for energy services if they had access to credit or if there was flexibility in the arrangements and timing for payment to fit their income patterns (for example, seasonally with crop harvests). But access to finance needs to be made available not just to the end users, but all the way along the service chain to organisations that help to manufacture, install and maintain the energy services. Access to appropriate finance is needed by households and end-users via credit or pre-payment mechanisms; credit is needed by small businesses, providers and installers; and working capital is needed by distributors and manufacturers. Many of these organisations are new small businesses with little track record on which to secure investment, making it difficult for them to get started, or expand to support growth in demand for energy services.

4.7 Various mechanisms have been developed to try and assist access to finance, for example, the provision of grants, soft loans (low interest loans), loan guarantees, provision of loans by development banks and aid agencies to projects that are seen by commercial banks as too 'high risk', revolving funds and innovative finance mechanisms (see Box 3).

4.8 In terms of large-scale financing, global investment in the power sector has in the last ten years begun to shift towards the private sector. Public-private partnerships are increasingly being recognised as having an important role to play across the board in looking at innovative finance mechanisms. DFID support two initiatives (see Box 4).

## DFID Initiatives in Public-Private Partnerships

Box 4

- The Public-Private Infrastructure Advisory Facility (PPIAF), a multi-donor technical assistance facility aimed at helping developing countries to improve the quality of their infrastructure through the use of private sector resources. This has now been operational for two years and has attracted support from eleven other donors. Current demands exceed resources and DFID are seeking to build on this success.
- The Emerging Africa Infrastructure Fund (EAIF), which was launched in January 2002, with an initial capital base of \$300 million. The feasibility study for the facility showed an immediate need for \$11 billion of investment. There is obviously scope to increase the capital base of EAIF and to establish a similar mechanism to cover urgent needs in the poorer countries of Asia (and possibly elsewhere).



## **Building local infrastructure, knowledge and skills**

4.9 Most poor people live in areas that lack access to infrastructure. This makes it more difficult and costly to provide energy services, as it is not easy to transport fuels and technology, there are few local organisations able to install, operate and maintain the technology, and few outlets to sell spare parts or appliances. Investment in infrastructure is important to increase the provision of energy services to poor people, and sustain that access. It is also important that the poor have access to information on the availability and use of alternative energy sources to help them make the right choice of energy services and to inform them on how to use them most efficiently.

4.10 Many projects have failed in the past because of inadequate local skills and knowledge to select appropriate technology and keep it maintained and in good running order. Training local people to install, operate and maintain energy service technology is important to ensure their reliable operation. But, there is the risk that people with newly developed skills will move from their remote rural locations to urban areas where they can get better paid jobs. This problem has been addressed in Vietnam by training women as they tend to be less likely to leave their families to work in urban areas. The Vietnam Women's Union has trained women to install and maintain solar home systems, which is proving to be a successful approach.

## **5. Integrating People-centred Energy Planning into Development Plans**

5.1 The links between energy and poor people's lives are complex and often indirect. As a result, the links are frequently overlooked altogether or thought of late on in the planning process. This often leads to less suitable energy services being supplied and in isolation to other energy needs in the community. Co-operation and co-ordination of energy planning across different government departments helps to achieve development goals and raise awareness of the role that energy can play across all sectors of the economy. But while co-operation and co-ordination are important, it is equally important to have a 'champion' for energy development with responsibility for increasing access to energy services for the poor. A 'one-stop-shop' for energy planning can help reduce the duration of planning procedures and, in turn, the costs of energy provision.

## **Integrating energy into poverty reduction strategies**

5.2 The demand for energy services is not often explicitly expressed in many development plans. But in assessments of issues constraining development, lack of access to energy is frequently one of the key bottlenecks. The links between energy and poverty are frequently overlooked in poverty reduction strategy papers (PRSPs). The energy chapter of the PRSP source book is designed to help governments diagnose and define energy policies and programmes, but it does not explicitly link energy with other pro-poor development activities, in part because energy is a derived demand.

5.3 Some PRSPs are starting to make the link between energy and poverty reduction. For example, the Uganda PRSP states that energy is to be promoted to increase the ability of the poor to raise their income, by encouraging the use of more efficient cooking technologies and by smart subsidies for rural electrification to encourage entrepreneurs to invest in power infrastructure in rural areas. The Uganda PRSP also mentions power sector reform and investment to foster power supply, in order to encourage economic growth and structural transformation. But while the government is committed to a programme of gradual substitution of fuelwood by rural electrification, the costs mean that it will take a long time for rural electrification to have a significant effect on fuelwood usage (currently 96% of domestic energy supply). Uganda's National Environmental Management Authority has identified the need for a more comprehensive energy provision strategy, which would be sustainable, adequate and affordable. This might include consideration of more efficient technology, renewable resources and use of fiscal measures to encourage sustainable provision and use.<sup>37</sup>

5.4 Ensuring sustainable energy is addressed in development plans will help to achieve the MDGs. The failure to make this linkage was explicitly identified in United Nations Development Programme's 1997 assessment 'Energy after Rio': *'Poverty has received scant attention from an energy perspective. This is remarkable given that energy is central to the satisfaction of basic nutrition and health needs, and that energy services constitute a sizeable share of total household expenditure in developing countries.'*<sup>38</sup> The 2000 World Energy Assessment states: *'Many rural development activities – agriculture, transport, water supply, education,*

<sup>37</sup> DFID Sustainable Development Key Sheet Issue 4, November 2000, 'Integrating Sustainability into PRSPs: the Case of Uganda'.

<sup>38</sup> UNDP (1997), 'Energy after Rio, Prospects and Challenges', Chapter 2 Energy and Major Global Issues, section 2.1.1.1.

*income generation, health care – have energy requirements. Yet the ministries and departments responsible for these activities rarely co-ordinate or co-operate with the ministry of energy, or with one another, to arrive at the most rational, integrated solution to their energy needs.*<sup>39</sup>

- 5.5 It is crucial, as with all development initiatives, to take the local context and situation into consideration when planning energy services. Large-scale energy programmes of the past did not consistently do this and often resulted in capture of benefits by the elites. Current national and local level programmes clearly need to involve communities in the planning process, to ensure energy services satisfy the demand, and are appropriate, socially acceptable and sustainable, economically and environmentally. Past experience has shown that participatory planning increases the choice of the poor, with inflexible top-down planning favouring the elites and normally the status quo.
- 5.6 It has been a common mistake in many energy projects in the past to ignore the requirements of a community for cooking and space heating. Communities need energy services for many different activities and for different sectors within the community – households, schools, medical centres, micro-enterprise development, and agriculture. Considering the energy needs of the whole community when planning energy supply can result in energy solutions that more efficiently and cost effectively meet energy demand. In some cultures, ownership of the energy technology is important to assist in its proper care and operation; it can also help prevent vandalism and theft.

### ***Energy as a facilitator***

- 5.7 Energy is often seen as a supply issue rather than considering what benefits energy services can provide. Traditionally, development agencies funded big power projects, mainly in power generation. These undoubtedly made a contribution to economic growth and studies have shown a close correlation between energy and per capita incomes.<sup>40</sup> But many big power projects were seen largely to fail in delivering the expected development benefits for poor people. This was due inter alia to lack of participatory planning to deliver what was appropriate to meet local

demand, lack of understanding regarding the local context and situation, lack of institutional infrastructure to regulate and deliver services and lack of local capacity to install, operate and maintain systems.

- 5.8 DFID's energy Knowledge and Research (KaR) projects have shifted fundamentally in design, from a technology focus to one focusing on local capacity building and participatory approaches. Recently, a people-centred approach has come to the fore, with an understanding that KaR must investigate energy-related issues from the basis of building on people's assets, fitting with their livelihood strategies and creating the enabling environment for them to escape poverty. But these energy activities still need to be scaled up from the pilot scale, local level to the policy level and integrated into country programmes.
- 5.9 Energy in a development context is not about technology provision first; it is about understanding the dynamics of the role that energy services play within people's lives, and responding to constraints in improving livelihoods. Energy needs to be considered as one of the facets of service provision affecting the development of the poor, and understood in terms of how the poor value and use it. Access to both finance and energy systems – availability, affordability and willingness to pay – need to be understood.

## **6. The Way Forward: A New Approach to Energy**

- 6.1 The analysis in this paper has a number of implications for development agencies and developing country governments. Of primary importance is the need to see energy as a vital element underpinning pro-poor development. This is best achieved by taking a people-centred approach to energy issues, oriented around the links between energy and poverty at the national level – macroeconomics, policy and planning – through to the impact on poor people's lives at the local level – time saving, health, education, transport, micro-enterprise development.
- 6.2 It is also important to take note of lessons learnt from the past to ensure that past mistakes are not repeated in the future. Looking more closely at the success and failures of development projects, and analysing the role

<sup>39</sup> World Energy Assessment (2000), Chapter 10, p380 Rural Energy in Developing Countries, edited by Jose Goldemberg (Brazil), published by UNDP, UNDESA, WEC.

<sup>40</sup> World Bank (1996), 'Rural Energy and Development, Improving Energy Services for Two Billion People'; and World Bank (2001), World Development Indicators 2001, Washington DC.

that energy played or could have played to improve outcomes, can help to identify best practice when considering energy issues. Where there are knowledge gaps, research can be identified and undertaken. In addition, steps can be taken to co-ordinate what is already happening and to help it to move forward.

- 6.3 The important issues to be considered reach beyond the technical concerns of energy technology (which have been the focus of the past) to include: equitable access to energy; restructuring the electricity supply industry to free up funds for pro-poor economic policies; and efficient and clean use of energy, helping to improve health and protect the environment.
- 6.4 The links between macroeconomic growth, energy and poverty reduction are also important and need to be understood more fully so positive action can more easily be taken to improve the lives of poor people. Greater awareness among non-energy specialists as to the role energy can play in helping to achieve goals in their sectors, could make whatever action they take more effective and help speed up achievement of the MDGs. There is an opportunity to consider energy as a cross-sectoral theme, integrated into development planning at all levels, rather than treating it only as a sector. At the same time, there are some important sector management issues related to energy such as power sector reform.
- 6.5 Taking an holistic approach and working at a number of different levels should result in innovative approaches to energy as a vehicle for increasing opportunities for poor people. Access to energy services can be facilitated through various activities: the development of partnerships, privatisation and liberalisation of energy utilities, good governance, reduced corruption (transparency and accountability) and targeted subsidies. Policy development and power sector reform are needed to help create the framework to enable poverty reduction. Public sector development and public-private partnerships are needed to provide investment, technology and knowledge transfer and local capacity-building. And incentives are needed to help engage key players in the market to provide greater access to energy services in urban and rural areas.

- 6.6 Developing a shared vision and understanding the reality of the wider context are important if energy is to be fully integrated into development plans. Poor people's participation in decision-making complemented by, and feeding into, pro-poor planning for government services should include awareness of, and sensitivity to, the role that energy services play in reducing poverty.
- 6.7 The complex links between energy and poverty reduction have not yet been fully drawn out, but it is essential to develop evidence-based policy that takes account of these links.<sup>41</sup> Some multilateral and bilateral agencies are beginning to recognise the importance of the role of energy in sustainable development and climate change issues, but it is important to increase understanding of the multi-faceted role of energy in poverty reduction. Some recent studies are helping to draw attention to the role of energy in these areas.<sup>42</sup> But there is much more that could be done, investigating more clearly the direct and indirect links between energy and health, education, urban migration, empowerment and inclusion, drudgery, time-saving, local employment and income generating activities. Some questions that would benefit from further understanding include those set out in Box 5.
- 6.8 The past two years have seen growing recognition of the importance of energy in development by the international community. The 9th session of the Commission on Sustainable Development (2001) concluded that 'Energy is central to achieving the goals of sustainable development'. And the G8's Genoa summit in 2001, considering the report of the G8 Renewable Energy Task Force, said that 'Renewable energy can contribute to poverty reduction'. But discussion is often driven by environmental considerations with little understanding of the development effects on the poor. There is an opportunity to use this interest to create greater awareness of the role that provision of energy services can play in speeding up the achievement of the MDGs.

<sup>41</sup> As is the case with most infrastructure services, see DFID paper 'Making Connections: Infrastructure for Poverty Reduction'.

<sup>42</sup> Three examples are: (i) 'Energy as a Tool for Sustainable Development' (UNDP & CEC DG Development, 1999), which looked at the different actors and their roles needed to increase the adoption of sustainable energy options in developing countries to assist sustainable development; (ii) 'World Energy Assessment: Energy and the Challenge of Sustainability' (UNDP, UNDESA and WEC, 2000), which was produced as input to CSD-9 to inform the discussion on energy and sustainable development; (iii) 'Energy Services for the World's Poor' (ESMAP, 2000), which aimed to provoke debate on the questions that must be answered to develop energy sector policies that play a positive and sustainable role in the battle against poverty.



6.9 Energy will feature prominently on the agenda at the World Summit on Sustainable Development (WSSD). DFID is supporting the approach of recognising the contribution that access to energy services has to the achievement of the MDGs working through the PRSP process. The matrix in Annex 1 has been used widely in meetings on WSSD. A number of targets for energy have been suggested.<sup>43</sup> But it is important to note that these can be counterproductive, drawing attention away from the issues of poverty reduction at hand. There is an opportunity to reinforce energy as an essential support to the MDGs, not as a goal in itself.

## 7. A Role for DFID [to be completed after consultation]

- 7.1 DFID is in a strong position to build partnerships with local and international institutions and, through learning from past experience, encourage maximum impact on poverty reduction through better utilisation of energy at macro and micro levels.
- 7.2 DFID is already contributing towards the development of a greater understanding of energy for poverty reduction through its involvement in the EU Energy

### Towards a Better Understanding of the Role of Energy in Poverty Reduction

Box 5

A number of questions about the role of energy in poverty reduction would benefit from further examination. For example:

- What is the relationship between reduced indoor air pollution through use of efficient cook stoves and the health of women and children? Energy experts have long focused on cook stove provision, on the (probably justified) assumption of reduced deforestation, energy efficiency and only latterly on the links between indoor air pollution and ARI. But the medical evidence categorically linking the two remains contentious, and needs further inter-sectoral consideration. Effective interventions and their relative costs also need research.
- How can access to energy services directly or indirectly contribute to reproductive health and population growth rates, for example, via access to better health care facilities, up-to-date medical knowledge and contraception?
- What opportunities are there for improving the quality of primary education through energy providing teacher access to the internet? How can the use of ICTs bring educational benefits to the poor including through community participation? The role of ICTs in development (with clear dependence on energy) is highlighted in the recent DFID Development Policy Department report.<sup>44</sup>
- What is the impact on urban migration of better access to energy in rural areas? This question is linked to the multitude of issues related to the ebb and flow of migration and the factors driving urbanisation.
- How can access to energy services provide empowerment and inclusion, particularly for women? This issue links to the broader debate about improved governance, and the rights of women within this process.
- How can access to efficient energy services reduce drudgery for women and children? There has been much work on issues relating to time-saving, fuelwood and water collection, and options for freeing up time for other activities. This work needs cross-sectoral collation and analysis.
- To what extent can energy services be provided on a commercially viable basis by locally owned, small-scale businesses using appropriate technologies, thus contributing to local employment and income generation?
- What indirect benefits result from energy sector reform? Work part-funded by DFID is looking at this in Orissa, India, where improvements are being made to rural power sector distribution.

<sup>43</sup> The G8 Renewable Energy Task Force has an aspirational target of one billion additional people served with renewable energy in the next decade; UNDP aims to halve the number of people without access to commercial energy by 2015; and Greenpeace/Body Shop propose two billion provided with renewable energy within ten years.

<sup>44</sup> 'The Significance of Information and Communication Technologies for Reducing Poverty', Final report, October 2001, Programme for Policy Studies, Development Policy Unit, DFID.

Experts Group, playing a lead role in the World Bank co-ordinated Energy Sector Management Assistance Programme (ESMAP), holding bilateral meetings with other donors, and contributing to the development of the energy elements of PRSPs. Where other organisations are pushing forward the boundaries in this area, information could be shared to greater effect, for example, better links between the World Bank new energy business strategy and country development strategy, and better sharing of information arising from PPIAF, the work of ESMAP, IFC and other donors.

- 7.3 DFID should draw on existing international knowledge and experience to build consensus around good practice and knowledge of energy utilisation at international, national and local levels. This would involve key actors within international and national agencies and governments, civil society and Whitehall. The focus would be on drawing together lessons from the past and ensuring future programmes are not condemned to making the same mistakes.
- 7.4 DFID should build closer links across Whitehall with the Foreign and Commonwealth Office, DEFRA and

DTI to ensure consistency in our approach to energy sustainability within the UK and internationally, while ensuring an awareness and higher profile for poverty reduction and the effect of international policy on poor people. This will facilitate two-way learning between the UK and international development partners.

- 7.5 *[This paragraph for consultation draft only, to be updated]* DFID is already involved in preparations of a number of diverse multi-stakeholder partnerships, known as Type II initiatives, for WSSD and should build on these (see Box 6). DFID is working to ensure that these are complementary and co-ordinated rather than separate free-standing initiatives.
- 7.6 Working with existing and new partners and building on existing work, especially the WSSD, DFID should undertake realistic analysis of incentives and of the political agenda that facilitate or constrain the contribution of energy to the MDGs. This would include working at different levels of society with elites and poor people. Guidance on reaching the priorities of poor people through innovative

### Type II Initiatives for Getting Energy Services to the Poor

### Box 6

- The Global Sustainable Energy Network: a global energy knowledge network proposed by UNEP that would link existing regional centres working on energy, environment and development issues, and through them reach national institutions. The network would promote sustainable energy approaches by making it easier for members to exchange information, share experience, provide practical policy and technical advice, promote sustainable energy investments, and help measure progress achieved against targets set. Rather than creating a new institution, the network would optimise the collective effectiveness of leading centres in both the North and South.
- The Global Village Energy Partnership (GVEP): this proposed partnership would seek to create a 10-year programme to reduce poverty and enhance economic and social development through the accelerated provision of modern energy services to those unserved or underserved. It would bring together developing and industrialised country governments, public and private organisations, multilateral institutions and other key stakeholders to resolve linkages between energy and poverty reduction in rural areas, facilitate the development and implementation of service delivery models, and catalyse the scale-up of investments in rural energy development projects and programmes. The partnership would capitalise on existing experiences and add value by providing knowledge or financing services that can facilitate and enhance the work of the individual partners. It would reach out to non-energy partners in the health, education or enterprise sectors for which energy is a key input to success.
- The European Union (EU) Initiative on Energy for Sustainable Development: this partnership's objective is to contribute to providing the access to energy necessary for the achievement of the MDGs. Through the partnership, the EU proposes to work with developing countries towards creating the necessary economic, social and institutional conditions in the energy sector to achieve their national development goals, in particular by providing and improving energy services for the 'energy poor'. The EU hopes to work with developing countries on the basis of a full menu of technical and institutional options.

mechanisms would be developed. This will be supported by targeted, demand-led research. We should analyse the potential of public-private partnerships within energy services (at national and local levels) and its effect on broader developmental goals, for example, transparency and budget reallocation. *[In doing all this we will work with xxxx country(ies) to be agreed with Regional Divisions]*

7.7 DFID should build on existing activities at the micro level, working with the poorest and with civil society to give the poor themselves a voice at policy level on appropriate action to address changes in energy provision that will affect the poorest, most vulnerable and most marginalised.

7.8 DFID should work with the World Bank and other partners to revise the energy section of the PRSP source book to encompass current thinking on energy as a provider of services at both macro and micro levels.

7.9 DFID should work with partner countries to build local capacity and identify the opportunities for the smaller developing countries to access additional resources available through the clean development mechanism, a Kyoto mechanism to encourage industrialised countries to develop emission-reducing technologies in developing countries that also have local development benefits.

7.10 DFID should raise the profile and understanding of energy for development, and encourage dialogue between energy and non-energy experts, including:

- Communicating the key messages about energy and development (using familiar language and linking to key issues, for example, PRSPs, MDGs, empowerment, health, education, water, environment etc.), to non-energy and energy experts, and to encourage dialogue about how energy can facilitate poverty reduction.
- The production of appropriate communication materials to facilitate dialogue.

7.11 The rapid rate of globalisation and high profile of sustainable development - economic, environmental and social - make this an essential time for DFID to use its position in the development community in the advocacy of considering energy as a key facilitator to achieving the MDGs.

# Annex 1: Draft Matrix of Energy and the Millennium Development Goals

Case studies that illustrate or support points made in the matrix are indicated in square brackets, i.e. [CS1] represents Case Study 1. A list of case studies can be found after the matrix.

*[This matrix still needs more brainstorming/input from people representing different sectors (for example, health, micro-enterprise development, education, water, transport, gender, etc.) so that their viewpoints are taken on board. We welcome comments and ideas for case studies that help to illustrate the links between energy and the MDGs]*

Goal	IMPORTANCE OF ENERGY TO ACHIEVING THE GOAL	
	Directly contributes	Indirectly contributes
<p><b>1) Extreme poverty and hunger</b></p> <ul style="list-style-type: none"> <li>To halve, between 1990 and 2015, the proportion of the world's people whose income is less than one dollar a day.</li> <li>To halve, between 1990 and 2015, the proportion of people who suffer from hunger.</li> </ul>	<ul style="list-style-type: none"> <li>Access to reliable energy services enables enterprise development [CS1]</li> <li>Lighting permits income generation beyond daylight hours</li> <li>Increased productivity from being able to use machinery [CS4]</li> <li>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.</li> <li>The majority (95%) of staple foods need cooking before they can be eaten and need water for cooking.</li> <li>Improving productivity throughout the food chain (in tilling, planting, harvesting, processing, transport etc.</li> <li>Reduction of post harvest losses through better preservation (for example, drying and smoking) also through chilling/freezing</li> </ul>	<ul style="list-style-type: none"> <li>Modern energy supplies are necessary for economic growth, supply must be pro-poor in design, and inclusive of the rights of people in the design of their basic services</li> <li>Efficient energy systems reduce costs, help create sustainable businesses/jobs and economies and underpin the social fabric of a region, [CS9, CS3, CS6]</li> <li>Privatisation of energy services can help free up government funds for social welfare investment [CS10]</li> <li>Clean, efficient fuels reduce the large share of household income spent on cooking, lighting and keeping warm (equity issue - poor people pay proportionately more for basic services)</li> <li>Energy for irrigation helps increase food production and access to nutrition. Clean water helps improve health. Increased health and nutrition opens up opportunities for employment and income generation.</li> <li>Chemical fertilisers are a form of captured energy, particularly ammonia-based ones where natural gas is the feedstock - indirect use of gas increases crop yields</li> </ul>
<p><b>2) Universal primary education</b></p> <ul style="list-style-type: none"> <li>To ensure that, by 2015, children everywhere will be able to complete a full course of primary schooling.</li> </ul>	<ul style="list-style-type: none"> <li>Energy can help create a more child friendly environment (access to clean water, sanitation, lighting and space heating/cooling) thus improving attendance at school and reducing drop out rates.</li> <li>Availability of modern energy services frees children's and especially, girls' time from helping with survival activities (gathering firewood, fetching water) lighting permits home study</li> <li>Lighting in schools allows evening classes and helps retain teachers, especially if their accommodation has electricity.</li> <li>Electricity enables access to educational media and communications (ICTs) in schools and at home that increase education opportunities and allow distance learning.</li> </ul>	<ul style="list-style-type: none"> <li>Access to energy provides the opportunity to use equipment for teaching (overhead projector, computer, printer, photocopier, science equipment)</li> <li>Modern energy systems and efficient building design reduces heating/cooling costs and thus school fees, enabling poorer families greater access to education [CS2]</li> </ul>

Goal	Directly contributes	Indirectly contributes
<p><b>3) Gender equality and women's empowerment</b></p> <ul style="list-style-type: none"> <li>Ensuring that girls and boys have equal access to primary and secondary education, preferably by 2005, and to all levels of education no later than 2015.</li> </ul>	<ul style="list-style-type: none"> <li>Availability of modern energy services frees girls' and young women's time from survival activities (gathering firewood, fetching water, cooking inefficiently, crop processing by hand, manual farming work)</li> <li>Good quality lighting permits home study</li> <li>Electricity enables access to educational media and communications (ICTs) in schools and at home that increase education opportunities and allows distance learning.</li> </ul>	<ul style="list-style-type: none"> <li>Lighting in schools allows evening classes and helps retain teachers especially if their accommodation has electricity.</li> <li>Street lighting improves women's safety</li> <li>Reliable energy services offer scope for women's enterprises [CS1, CS4]</li> </ul>
<p><b>4) Child mortality</b></p> <ul style="list-style-type: none"> <li>To reduce by two-thirds, between 1990 and 2015, the death rate for children under the age of five years</li> </ul>	<ul style="list-style-type: none"> <li>Indoor air pollution contributes to respiratory infections that account for up to 17% of deaths in children under five years old.</li> <li>Gathering and preparing traditional fuels exposes young children to health risks and reduces time spent on child care</li> <li>Modern energy can be safer (fewer burns, accidents and house fires) [CS4]</li> </ul>	<ul style="list-style-type: none"> <li>Provision of nutritious cooked food, space heating and boiled water contribute towards better health</li> <li>Electricity enables pumped clean water and purification</li> <li>Cold chain provision allows access to vaccinations.</li> <li>[CS7].</li> </ul>
<p><b>5) Maternal health</b></p> <ul style="list-style-type: none"> <li>To reduce by three-quarters, between 1990 and 2015, the rate of maternal mortality.</li> </ul>	<ul style="list-style-type: none"> <li>Energy services are needed to provide access to better medical facilities for maternal care including medicine refrigeration, equipment sterilisation and operating theatres.</li> </ul>	<ul style="list-style-type: none"> <li>Indoor air pollution and carrying heavy loads (fuelwood and water) may contribute to poor health in women (back and pelvic damage) making women less fit for childbirth and at more risk of complications.</li> <li>Energy can help produce and distribute sex education literature and contraceptives.</li> <li>ICTs for long distance learning and 'distance medicine' requires a power supply</li> <li>Provision of nutritious cooked food, space heating and boiled water contribute towards better health and all need energy [CS7].</li> </ul>
<p><b>6) HIV/AIDS, malaria and other major diseases</b></p> <p>By 2015, to have halted and begun to reverse:</p> <ul style="list-style-type: none"> <li>the spread of HIV/AIDS</li> <li>the scourge of malaria</li> <li>the scourge of other major diseases that afflict humanity.</li> </ul>	<ul style="list-style-type: none"> <li>Electricity in health centres enables night availability, helps retain qualified staff and allows equipment use (for example, sterilisation, medicine refrigeration)</li> <li>Energy for refrigeration allows vaccination and medicine storage for the prevention and treatment of diseases and infections.</li> <li>Safe disposal of used hypodermic syringes by incineration prevents re-use and the potential further spread of HIV/AIDS [CS8]</li> </ul>	<ul style="list-style-type: none"> <li>Energy is needed to develop, manufacture and distribute drugs, medicines and vaccinations.</li> <li>Electricity enables access to health education media through ICTs</li> </ul>
<p><b>7) Environmental sustainability</b></p> <ul style="list-style-type: none"> <li>To stop the unsustainable exploitation of natural resources; and</li> <li>To halve, between 1990 and 2015, the proportion of people who are unable to reach or to afford safe drinking water</li> </ul>	<ul style="list-style-type: none"> <li>Increased agricultural productivity is enabled through the use of machinery and irrigation which in turn reduces the need to expand quantity of land under cultivation reducing pressure on ecosystem conversion</li> <li>Energy can be used to purify water or pump clean ground water locally reducing time spent collecting it and reducing drudgery.</li> <li>Traditional fuel use contributes to erosion, reduced soil fertility and desertification. This can become more sustainable through substitution, improved efficiency and energy crops</li> <li>Using cleaner, more efficient fuels will reduce GHG emissions [CS3]</li> </ul>	<ul style="list-style-type: none"> <li>Clean energy production can encourage better natural resource management including improved water quality [CS6]</li> <li>National sustainability aided by greater use of indigenous renewable energy sources instead of imported fossil fuels as economy grows</li> <li>Rural energy services enable non-farm-based enterprise and processing of non-timber forest products</li> <li>Efficient use of energy helps to reduce local pollution and improve conditions for poor people [CS5, CS4]</li> </ul>

# Case Studies Illustrating the Links between Energy and the Millennium Development Goals

Case Study Number	Description	Source of information
Case Study 1	Sustainable Fisheries Livelihoods Project, West Africa	Workshop report, event organised by ICFS (International Collective in Support of Fishworkers), CNPS (Collectif National des Pecheurs Artisanaux du Senegal), CREDETIP (Centre de Recherches pour le Developpement des Technologies Intermediaires de Peche, with the support of FAO-DFID Sustainable Fisheries Livelihood Project (SFLP), <a href="http://www.fao.org/fi/projects/sflp/index.html">www.fao.org/fi/projects/sflp/index.html</a>
Case Study 2	Gansu Basic Education Project, China	DFID Project Memorandum April 1999, Review documents 2000, 2001
Case Study 3	Improving the Environmental Performance of Industries in the Urals Region, Russian Federation	DFID Project Memorandum, 2001
Case Study 4	Shea Butter Extraction Project, Northern Ghana	“Energy for Rural Women’s Enterprises. Ghana”, Sabina Anokye Mensah, in “Generating Opportunities, Case Studies on Energy and Women”, Eds Salome Misana & Gail V.Karlsson. UNDP, 2001
Case Study 5	Water and energy conservation in the textile sector, Egypt	“Industrial Pollution Prevention, Case Study: Textile Sector. Water and Energy Conservation. El-Nasr Company for Spinning and Weaving, Mahalla, El-Kobra, Egypt”. On SEAM website: <a href="http://www.seamegypt.org">www.seamegypt.org</a>
Case Study 6	Evolving payment schemes for forest watershed protection services, Costa Rica	Source: Landell-Mills, N., J. Bishop, and I. Porras. Forthcoming. “Silver bullet or fools’ gold? Developing markets for forest environmental services and the poor”. Instruments for sustainable private sector forestry series. IIED, London.
Case Study 7	Elements of the Fuelwood Debate – Fuel Use in the Household	As yet unpublished literature review, by Sonja Vermeulen, conducted under the ODI-CIFOR Research Project ‘Woodfuel in Africa: Crisis or adaptation?’, Gill Shepherd, ODI, 1999–2001.
Case Study 8	Low Cost Medical Waste Incinerators	Professor DJ Picken and Mike Bennett, De Montfort University. <a href="http://www.dmu.ac.uk/mwi">www.dmu.ac.uk/mwi</a> email: <a href="mailto:djpicken@jee.org.uk">djpicken@jee.org.uk</a> , <a href="mailto:edtc@globalnet.co.uk">edtc@globalnet.co.uk</a>
Case Study 9	Gender, Poverty Reduction and Infrastructural Development in Bangladesh	Bangladesh Infrastructure Scoping Study (BISS) – Cashin and Musillo, September 2001 for DFID Bangladesh
Case Study 10	Improving Rural Power Distribution – Mass-Produced Community Development in Orissa, India	Harper, M. “Micro-privatising” rural power distribution – mass produced community development in Orissa, India. Enterprise Development, Cranfield University School of Management, UK. See Harper, M., “Public services through private enterprise – micro privatisation for improved delivery”, Sage Publications New Delhi and ITDG Publications, London, 2000, for further examples of the same approach

## DEPARTMENT FOR INTERNATIONAL DEVELOPMENT

The Department for International Development (DFID) is the UK government department responsible for promoting development and the reduction of poverty. The government first elected in 1997 has increased its commitment to development by strengthening the department and increasing its budget.

The central focus of the Government's policy, set out in the 1997 White Paper on International Development, is a commitment to the internationally agreed target to halve the proportion of people living in extreme poverty by 2015, together with the associated targets including basic health care provision and universal access to primary education by the same date. The second White Paper on International Development, published in December 2000, reaffirmed this commitment, while focusing specifically on how to manage the process of globalisation to benefit poor people.

DFID seeks to work in partnership with governments which are committed to the international targets, and seeks to work with business, civil society and the research community to this end. We also work with multilateral institutions including the World Bank, United Nations agencies and the European Community.

The bulk of our assistance is concentrated on the poorest countries in Asia and sub-Saharan Africa. We are also contributing to poverty elimination and sustainable development in middle income countries in Latin America, the Caribbean and elsewhere. DFID is also helping the transition countries in central and eastern Europe to try to ensure that the process of change brings benefits to all people and particularly to the poorest.

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