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Issues



ENERGY FOR THE POOR

Underpinning the
Millennium Development Goals

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the Millennium
Development Goals

Department for International Development
August 2002

FOREWORD BY THE SECRETARY OF STATE

At the World Summit on Sustainable Development it is important that the role energy can play in underpinning our efforts to achieve the Millennium Development Goals is recognised. This document highlights some of the ways in which access to clean, efficient energy services can tackle poverty and make a difference to poor people's lives. We need to encourage a wide range of people from different sectors and in different organisations, public, private, NGOs and civil society, to work together. We need to listen to poor people's views on energy, integrate energy into development processes and develop and embrace a new approach to energy for poverty reduction.

Clare Short

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Secretary of State for International Development
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EXECUTIVE SUMMARY

Energy can play a crucial role in underpinning efforts to achieve the Millennium Development Goals (MDGs) and improving the lives of poor people across the world. Lack of access to adequate, affordable, reliable, safe and environmentally benign energy is a severe constraint on development. And the number of people without that access, even to meet their basic needs, is staggering: two billion people lack clean, safe cooking fuels and must depend on traditional biomass sources.

Poor people see access to energy as a priority. Many already pay more per unit of energy than the better off due to inefficient technology and corruption. And energy is not just about electricity, neither is electricity always the best energy source for all needs, biomass, kerosene and other sources are important too. Finally, it should be recognised that energy alone will not reduce poverty but it does have an important role to play alongside other things: raw materials, finance and local skills.

Demand for energy is a 'derived demand': people do not want energy in itself but the 'energy services' it provides – cooking, lighting, heating, water pumping, transport, etc. A full menu of options should be considered for providing energy services to the poor, including renewable energy sources, traditional biomass, and fossil fuels combined with cleaner, more efficient energy technology. The benefits of cleaner technology need to be balanced against the benefits that other technologies can provide. Reliance on fossil fuels and biomass will continue for many years, so development plans should include them in the overall energy strategy, particularly how to encourage more sustainable management and cleaner more efficient uses.

Energy can contribute to all three pillars of sustainable development - economic, social and environmental. But the local and national context - political, social, technical and economic - should be taken into account for all energy interventions since 'one solution does not fit all'. Flexibility of approach and intervention is needed to fit with the specific context and priorities. Co-ordination and consistency is needed between sectors to maximise the benefits of providing access to energy for the poor. And more attention needs to be paid to social issues related to energy use than in the past.

A new approach needs to be taken to ensure that energy underpins efforts to achieve the MDGs. This means:

- Taking a people-centred approach, reaching beyond the technical issues, to deliver energy services that meet peoples' needs and priorities.
- Ensuring that communities have a voice in the decision-making process on how to meet their energy needs.
- Working across all sectors to integrate energy more fully into development processes early on.
- Working at local, national and international levels, in order to develop pro-poor policies based on real evidence of the impact of energy on poor people.
- Taking an holistic approach to energy rather than a project-based approach.
- Building a deeper understanding of the links between energy and poverty reduction.

Improving access to appropriate affordable energy services through: better management and regulation of the energy sector; increasing the efficiency of energy provision and use; increasing the choice of energy services; developing local capacity; encouraging partnerships and attracting private investment in energy services; providing access to finance at all levels and reducing costs; and designing smarter subsidies and other policies that work for poverty reduction.

The high profile of sustainable development – economic, social and environmental – make this an opportune time for DFID to use its position in the development community in the advocacy of energy as a key facilitator to achieving the MDGs. DFID is in a strong position to build partnerships with governments, NGOs, the private sector, and multilateral and bilateral development agencies to help ensure better utilisation of energy at national and local levels to reduce poverty reduction.

1 THE IMPORTANCE OF INCREASING ACCESS TO ENERGY SERVICES

*'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.'*¹

1.1 This paper is aimed at a wide range of people and organisations involved in development that are concerned with meeting the Millennium Development Goals (MDGs). It is intended for both energy and non-energy specialists to raise awareness of the role that energy can play in poverty reduction and to encourage them to adopt a new approach to energy

provision, one in which energy is, from the outset, integrated fully into development processes. In the first instance, this means dispelling a number of misconceptions about energy (see Box 1), as well as recognising energy not simply as one sector among many, but as an essential service to a wide range of sectors. It is vital to repair the current 'disconnect' between energy strategies and strategies elsewhere in the economy, and to understand more fully the requirement that all sectors have for energy services. DFID have an important role to play in building partnerships and in adopting the new approach to energy for poverty reduction.

Box 1: Energy for Poverty Reduction: Myths and Reality²

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 may not use the term 'energy', but they can spend far 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 electricity, whether from the grid or decentralised renewable energy sources, will solve all the energy service needs of the poor.
- **Reality** - development specialists often wrongly talk of 'electricity' when they mean 'energy', and vice versa - all people need access to a range of energy sources to satisfy their energy service needs - cooking, heating, transport and communication.
- **Myth** - the poor cannot pay for energy services.
- **Reality** - many poor people often already pay more per unit of energy than the better off, partly due to inefficient conversion technology and partly to corruption.
- **Myth** - new technology alone - such as solar photovoltaics and fuel cells - will improve poor people's access to energy services.
- **Reality** - technology is rarely the constraint: addressing institutional, political and social problems that constrain sustainable livelihoods and lack of knowledge and skills is often more important.
- **Myth** - only people in rural areas suffer from lack of access to energy.
- **Reality** - poor people in urban areas also suffer from lack of access to energy services and their numbers are likely to increase since it is predicted that 61% of the world's population will be living in urban areas by 2025.³

¹ Commission on Sustainable Development, 9th session, Agenda Item 4, Decision, Energy for Sustainable Development, Section 6.22 (2001)

² Poverty encompasses low incomes, deprivation (hunger, sickness, lack of shelter and clothing), low achievements in education, vulnerability, exposure to risk, voicelessness and powerlessness. World Development Report 2000/2001, Attacking Poverty, The International Bank of Reconstruction and Development, The World Bank 2001.

³ UNHCR (1999), 'An Urbanising World, Global Report on Human Settlements'.

Box 2: Energy and the Millennium Development Goals

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 and 95% of staple foods need cooking before they can be eaten.

To reduce child and maternal mortality; and to reduce diseases - energy is a key component of a functioning health system, for example, lighting operating theatres, refrigeration of vaccines and other medicines, sterilisation of 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 efficiency and use of cleaner alternatives can help to achieve sustainable use of natural resources, as well as reducing emissions, which protects the local and global environment.

UNDERPINNING THE MILLENNIUM DEVELOPMENT GOALS

1.2 Energy plays a critical role in underpinning efforts to achieve the MDGs and improving the lives of poor people across the world. (Box 2 and Annex 1 describe the direct and indirect links between energy and the MDGs).

1.3 Energy encompasses light, heat, mechanical power and electricity from a combination of fuels - fossil fuels such as coal, gas and kerosene, plus renewable energy sources such as solar power, wind power, hydropower and biomass - and fuel technologies - ranging from traditional three stone fires to efficient, clean electricity systems. Demand for energy is a 'derived demand': no one wants energy in itself but rather for the services it can provide. The wide range of 'energy services' - cooking, water heating, lighting, refrigeration, water pumping, transport and communications, etc. - made possible by fuels and fuel technology - can have a major impact in facilitating sustainable livelihoods, improving health and education and significantly reducing poverty. Conversely, the absence of adequate, affordable, reliable, safe and environmen-

tally benign energy services can be a severe constraint on sustainable economic and human development.

1.4 Poor people often have a limited choice of technologies that convert energy to useful services. The technologies most readily available to them are typically inefficient or low quality, so they end up paying much more per unit of useful energy service than the rich. For example, light generated from a kerosene lamp costs 70 times more than the equivalent light from mains electricity, while light from a candle costs 150 times more; power from a battery costs 10 to 30 times more than from mains electricity.⁴

1.5 No country has substantially reduced poverty in modern times without massively increasing the use of energy, replacing human and animal labour with more convenient and efficient sources of energy and technology.⁵ Different income groups have different requirements for which they use energy and, as income rises, they meet their needs with different energy sources and different conversion technologies. Some energy sources are better suited for a particular use than others: electricity, for example, is much sought after as the most

⁴ Data taken from: 'The role of energy in the development of sustainable livelihoods: a set of tables' by Andrew Barnett, 5 April 2001 (Table 2, Annex 2); and 'The Uganda Rural Electrification Strategy Study', report 221/99, ESMAP, September 1999.

effective source of lighting and for powering motors and communication technologies; but is rarely used by poorer people for cooking.

1.6 In the recent past, there has been an excessive focus on the provision of electricity to poor people, which has been to the detriment of other energy sources. 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 the poor. For example, extending an electricity grid to households in rural areas can cost seven times more than for grid electricity in urban areas.⁶ In most of sub-Saharan Africa, less than 10% of the population is connected to electricity. It is estimated that it would take over 250 years to supply all households in Uganda with electricity at current rates of electrification.⁷

1.7 The very poorest people, who cannot afford to pay anything for energy services and rely on energy sources that they can collect free of charge, can gain indirect benefits from energy services provided to communities. For example, where it is cost-effective to provide electricity (through the grid or via decentralised systems) or other energy services to remote communities, providing energy for community facilities such as schools, hospitals and trade and community centres can benefit a wider cross-section of the community, even if they are unable to afford household energy services themselves.

ENERGY AND SUSTAINABLE DEVELOPMENT

1.8 At a local level, energy services help improve the quality of life and facilitate sustainable livelihoods. At a national level, they help to facilitate stable economic development, attract foreign direct investment, allow access to global markets, have an impact on the national and global environment and can affect national budget allocations. At the same time, lack of access to energy can cause conflict. Co-operation between regions over energy supply and access (as with the South African power pool) can help establish links between countries that can help reduce tension and conflict.

1.9 Energy services 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. To redress the balance, it is important to take a people-centred approach, looking at how energy affects peoples' lives directly and ensuring that all three pillars are considered in parallel.

1.10 Energy supports economic development at the national level by underpinning industrial growth and, via transport and communications, providing access to international markets and trade. But, while there is clearly a strong relationship between growth in energy use and national income, the causal connection probably works both ways, greater energy use supporting higher incomes and those with higher incomes being able to afford more energy.

1.11 Energy facilitates economic development at the local level by improving productivity and enabling local income generation through improved agricultural development (irrigation, crop processing, storage and transport to market) and through non-farm employment, including micro-enterprise development. An emphasis on productive uses of energy services is important in helping people out of poverty. As an indicator of local recognition of the importance of energy for businesses, Ugandan manufacturers, who were asked to rank the constraints on their firms' activities, identified power breakdown and voltage fluctuations as their top two problems.⁸

1.12 A number of statistics show the very strong association between increasing commercial energy consumption and human welfare, as measured by indicators like the Human Development Index (which measures life expectancy and educational achievement as well as income).⁹ Energy services help facilitate basic survival activities, for example, approximately 95% of staple foods (such as rice, grains and green bananas) need cooking before they can be eaten. Indeed, equity of access to basic energy services for cooking, space heating and lighting, like access to water, could be considered a human right. The rights-based agenda highlights inclusion of poor people, their participation in decision-making about their development, and the responsibility of government, as well as the poor, to fulfil obligations. A recent study on energy and poverty in China found that access to electricity made people

⁵ This paper concentrates on 'inanimate' energy not the 'animate' sources of human and animal energy that impoverished people expend in such large quantities. The DFID Food Security paper 'Eliminating hunger' and DFID Agriculture paper 'Better livelihoods for the poor: the role of agriculture' cover issues related to human and animal power and energy from food.

⁶ World Energy Assessment: Energy and the Challenge of Sustainability. New York: United Nations Development Programme, United Nations Department of Economic and Social Affairs and World Energy Council.

⁷ Arun Sanghvi, 2002, presentation at the World Bank Energy Forum, Washington, June 2002.

⁸ Booth, Hanmer and Lovell (2000), 'Poverty and Transport', a report prepared for the World Bank in collaboration with DFID, ODI London.

⁹ Energy Needs for Sustainable Human Development by Carlos E. Suarez. In J. Goldemberg and T.B. Johansson (eds), Energy as an Instrument for Socio-economic Development, United Nations Development Programme, New York, 1995.

and communities feel included in the modernising process of the national economy.¹⁰

1.13 Energy contributes towards social capital¹¹, by powering transport and communications so that poor people can maintain contact with their extended family and friendship groups. Energy is also used to prepare meals used to celebrate special events, which is important for maintaining social capital. Poor households draw on their social capital in order to cope better at times of shock or stress.

1.14 Energy is strongly linked to the environment. Many energy sources are drawn directly from the environment, requiring sound management for these sources to be sustainable. Energy use also affects the environment. Emissions from fossil fuels, for example, reach beyond the local and national levels to affect the global environment and contribute to climate change. The poorest people often live in the most ecologically sensitive and vulnerable physical locations. These areas may be the most affected by the predicted effects of climate change such as increased frequency of extreme events. The risks facing poor people are often increased by the unsustainable use of biomass resources by themselves or others.¹² The poor may also face difficult trade-offs in their search for livelihoods: 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.'¹³

1.15 Many dilemmas of this kind are posed by the search for environmentally responsible energy services. The World Commission on Dams highlights the fact that hydropower from large dams has made a significant contribution to economic development, but at unacceptably high prices with respect to environmental and social outcomes. Such imbalances can be addressed by learning from the past and negotiating outcomes where the interests of the most powerful stakeholders are balanced with the needs of less powerful stakeholders, and are both more equitable and transparent. Use of indigenous renewable resources combined with efficient supply and use of fossil fuels, with cleaner technologies, can help reduce the

environmental effects of energy use and help developing countries make a 'technology leap' that avoids 'lock-in' to more polluting fossil fuel technologies. At the same time, careful management of energy resources, such as forests for fuelwood and water for hydropower, is important to promote economic growth, protect ecosystems and provide sustainable natural resources.¹⁴

1.16 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. A full menu of energy options should be considered since in some cases, efficient, clean wood fires will be the best option, while in others, liquid petroleum gas (LPG) or kerosene may be preferable.

ACCESS TO ENERGY AND THE IMPACT ON PEOPLE'S LIVES

'...in South Asia, rural women use the word "darkness" to tell me about their drudgery...anxiety, also, of knowing that this is all you have to pass on to your daughters...'¹⁵

1.17 Energy interacts with people's lives in many different ways, from the basic survival activities to increasing productivity. Productivity can be increased by extending the working day with lighting and by mechanisation, for example, 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.

1.18 Most poor people currently meet the bulk of their inanimate energy needs by collecting fuelwood and other biomass. This costs very little in cash terms, but is hugely expensive in terms of the time it takes. 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 collecting 10 kilograms of wood over distances of 4-8 kilometres.¹⁶ In the Drass region of Leh in the Himalayas, women sometimes have to camp overnight when collecting fuelwood, as the distances they need to go are getting longer.¹⁷

¹⁰ Personal communication with Henry Lucas, Institute of Development Studies at Sussex University, Brighton, United Kingdom.

¹¹ Social capital refers to those resources inherent in social relations, which facilitate collective action. Social capital resources include trust, norms and networks or association representing any group, which gathers consistently for a common purpose.

¹² The term 'biomass' is used here to include fuelwood, dung, leaves, agricultural waste and crop residues that can be used as an energy source.

¹³ *Voices of the Poor, Crying out for Change*. Deepa Narayan, Robert Chambers, Meera K. Shah and Patti Petesch. The International Bank of Reconstruction and Development / World Bank, Washington, USA. (2000).

¹⁴ 'Dams and Development. A New Framework for Decision-making', *The Report of the World Commission on Dams*, November 2000, Earthscan, London.

¹⁵ Mieko Nishimizu, Vice President, South Asian Region, World Bank. Keynote speech, 'Energy, Health and Gender – Thinking differently about what we do', presented at a regional workshop – household energy, indoor air pollution and health. 9 May, 2002, New Delhi.

¹⁶ ASTRA 1982, references in *World Energy Assessment 2000*, Ch2, p52.

¹⁷ Personal communication with Dr Pachauri, TERI, India.

Box 3: Sustainable Fisheries Livelihoods Project, West Africa

In June 2001, a workshop was held to enable artisanal fish processors and traders to identify common problems in relation to fish processing and trade at the regional level. In a group discussion, 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 that were identified by women processors, and to facilitate access to land to be managed by women processors as woodlots for fuel supplies.¹⁹

1.19 Access to alternative forms of energy may also affect people's health. Use of biomass fuels for cooking and space heating creates indoor air pollution, which has been linked with increased rates of acute respiratory tract infection (ARI) in children.¹⁸ Energy is also important in facilitating access to health care by powering 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. Access to good healthcare is also reliant on an efficient, functioning healthcare system. This requires a number of elements including appropriately trained and supervised personnel, a reliable supply of drugs and essential equipment, and an appropriate physical infrastructure. Energy services can contribute in a number of ways to the efficient performance of this system, for example, through ensuring reliable heating, lighting, sterilisation and refrigeration, as well as safe disposal of medical waste.

1.20 Energy for lighting allows study at night and facilitates access to learning materials through radio, the internet 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. 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 (see Box 3).

THE SCALE OF THE PROBLEM

1.21 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.²⁰ 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.²¹

1.22 The number of people without access to energy services to meet their basic needs is staggering: two billion people lack clean, safe cooking fuels and must depend on traditional biomass sources; and 1.7 billion are without electricity.²² Most of these people live in Asia and sub-Saharan Africa. To meet the basic cooking needs of the two billion people not served by modern fuels would correspond to no more than 1% of global commercial energy consumption.²³ This figure should be achievable, especially if lessons are drawn from the past.

1.23 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

¹⁸ ARI accounts for 20% of the 11 million deaths which occur each year. But it is not known what proportion of these deaths can be attributed to indoor air pollution (WHO 2000, based on 1999 data).

¹⁹ 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

²⁰ World Energy Outlook 2000: Highlights. Paris: OECD/IEA.

²¹ World Energy Assessment (2000).

²² World Energy Assessment (2000). Chapter 2, Energy and Social Issues, edited by Amulya Reddy (India), published by UNDP, UNDESA, WEC.

²³ To meet basic cooking needs of those without access to modern fuels is estimated to require an average of 0.1kW per capita. Reddy (1999), quoted in the World Energy Assessment, 2000.

poverty and improve their quality of life? All energy services cost money, and are bought and sold in various markets. At present, energy markets are not very effective in providing energy services in developing countries. Reform of these markets and improvement of their governance arrangements are central to the strategies currently adopted by the international community to increase the supply, improve the efficiency and extend the access of modern energy services.

1.24 Four issues are particularly important for poverty reduction:

- How to improve the effectiveness of energy sector management.
- How to attract more capital in order to increase access to energy.
- How to make subsidies and other government policies work for poverty reduction.
- How to make energy services affordable.



Energy for lighting allows study at night and facilitates access to learning materials through radio, the internet and other ICTs

2 THE EFFECTIVENESS OF ENERGY SECTOR MANAGEMENT

2.1 Developing country governments can play a major role in increasing the efficiency of utilities and reducing the drain on public funds, notably through restructuring their national energy producers and improving the way they are regulated. Efficiently run utilities facilitate budgetary reform, freeing up money for alternative investments, including in the social sector in medical facilities and schools. While much of the focus of recent discussions has been on the power sector, the markets for fuelwood, charcoal, kerosene, coal, gas and transport fuels could also gain some cost and efficiency benefits from reform.

INEFFICIENT MANAGEMENT AND THE IMPETUS FOR ENERGY SECTOR REFORM

2.2 In 1992, total government subsidies for energy in developing countries were estimated at over US \$50 billion.²⁴ This is more than the total official development assistance these countries received that year. The government of the Indian state of Andhra Pradesh, for example, was paying subsidies of US \$600 million a year to the electricity board prior to power sector reform. The Indian minister for power indicated that in total state electricity boards lose the equivalent of US \$9 billion a year.²⁵

2.3 The inefficient management of utilities has had a number of causes, with many of the problems deriving from the need for government intervention. For example, in many cases, the investments required were beyond the capacity of (local) private capital. In addition, the utilities' activities often had a huge impact on the management of the economy, particularly when imported fuels were bought in foreign exchange, but end users paid in local currency.

2.4 In larger and more open economies, the rationale for government intervention was less clear. But the relatively large scale of these utilities meant that governments tended to politicise their management. They also used them to achieve a

wide range of other objectives such as employment (which led to overstaffing) or the transfer of resources to particular groups (such as supplying power to farmers almost free of cost).

2.5 Utilities offer considerable opportunities for corruption in all parts of the world, but particularly in developing countries. In Transparency International's Bribe Payers Index in 2002, the power generation and transmission sector came fifth out of 17 in a ranking of sectors that are most prone to bribes demanded by officials.²⁶ 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. 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.

2.6 The debate about whether to reform energy markets is now largely won. Few people who have the interests of poor people at heart would advocate the maintenance of many of the current energy systems that are badly managed, deeply corrupt and suck in vast amounts of public money to underwrite huge and recurring losses. But there is still much to be learned about how reform can be made to work in the particular circumstances of developing countries, where the existing infrastructure, technical capacities and legal frameworks are weak. Furthermore, reform is intimately linked to the political process and its success depends on strong political commitment in the face of opposition from vested interests.

2.7 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 the better off, generally neglecting institutional and market constraints to serving the poor.'²⁷ This underscores the need to develop pro-poor policies that have a real impact on providing high quality energy to the poor. And it strengthens the case for

²⁴ 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.

²⁵ Nickhil Desai, *World Bank*, 2002.

²⁶ Transparency International Bribe Payers Survey 2002, at www.transparency.org/cpi/2002/bpi2002.en.html#sectors

²⁷ Survey results undertaken by Robert Bacon in 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

policy-makers also focusing on creating better and sustainable conditions for the supply of traditional biomass fuels and fossil fuels in parallel, at least in the short run.²⁸

2.8 Some of the challenges related to traditional biomass fuels centre around how to encourage them to be used more efficiently and in ways less damaging to health and the environment, and how to charge the full replacement cost of, for example, fuelwood, so sustainable use and replenishment can take place. If fuelwood is under priced, it can undermine the market for cleaner alternative fuels and cleaner more efficient fuelwood technologies. Emphasis needs to be placed on removing obstacles to entrepreneurs and communities in the sustainable management of forests. DFID supports community ownership and management of forests. Over a quarter of all forests in developing countries are now managed or owned by communities.

PRIVATISATION AND ENERGY PRICES

2.9 The 'corporatisation' of management appears to be an essential first step to efficiency, allowing managers to operate within simple parameters laid down by the government or its appointed regulators, and not subject to day-to-day political interference. Although there are different ways to achieve this, privatisation is an effective way to get round the problem of public sector managers struggling to keep free from political interference. In addition, privatisation has often brought in more innovative and flexible approaches to management.

2.10 Grid extension programmes in the past have, in some cases, been shown to be very costly and uneconomic. Full cost management accounts have 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 being recognised as complementary to the main grid, and can in many rural areas provide a cheaper and more reliable electricity supply.

2.11 Utility reform can initially result in an increase in energy prices, particularly if supplies were heavily subsidised prior to privatisation. Full cost pricing should lead to a more sustainable power sector in the longer term. Targeted subsidies can be used to assist the poor and prevent the better off from effectively being subsidised by the rest of the population. In

Uganda, for example, US \$50 million was being spent a year on subsidies but only 6% of the population had access to electricity.

2.12 The initial hike in energy prices can be reduced to some degree over time with the phasing in of more efficient energy technologies and competition in the market. 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.²⁹ 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 1997.³⁰

GOOD GOVERNANCE, REGULATION AND STANDARDS

2.13 Economic reform is part of a larger process of good governance. Properly thought-out reform that makes the energy utilities more transparent and accountable has the potential to reduce corrupt practices. Good governance is needed to support the battle against corruption. In places that are rich in resources, where fossil fuels or timber are plentiful, there is a risk that concessions are not transparently awarded, managed or taxed. This reduces income to government, which could be used for development goals.

2.14 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 in order to drive improved energy efficiency and to ensure that any resulting cost savings are shared appropriately between the 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 obtain access.

2.15 The task of regulation is complicated by the fact that regulators do not have a precise picture of the costs of suppliers. In addition, there is the possibility that they can be captured by groups with vested interests. Hence, regulation can

²⁸ Kebede, Bereket (March 2002), 'Poverty, Energy and the Millennium Development Targets', Centre for the Study of African Economics, St Antony's College, Oxford University.

²⁹ Plane (1999), 'Privatisation, Technical Efficiency and Welfare Consequences: the case of the Côte d'Ivoire Electricity company (CIE)', *World Development* 27, 343-60.

³⁰ 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.

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.³¹ The chances of improving the supply of electricity to the poor increase with effectiveness of the regulation.³² But to date, there is little evidence that regulators have devoted sufficient attention to providing access to poor people. Capacity building among regulators is essential to help address this.

A full menu of options should be considered for providing energy services to the poor, including renewable energy sources, traditional biomass and fossil fuels

2.16 Alongside regulation, it is important to ensure social and environmental standards are clearly defined, and included in incentive structures. This can increase investor confidence and it improves returns to government from the privatisation process. Care should be taken to set standards at appropriate levels since too high a standard may become an obstacle to the expansion of fuels for the poor. Relaxing some technical standards, without compromising on safety, can help increase the access of the poor to fuels.³³



³¹ 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.

³² Kebede, Bereket (March 2002), 'Poverty, Energy and the Millennium Development Targets', Centre for the Study of African Economics, St Antony's College, Oxford University.

³³ Kebede, Bereket (March 2002), 'Poverty, Energy and the Millennium Development Targets', Centre for the Study of African Economics, St Antony's College, Oxford University.

3 ATTRACTING MORE CAPITAL TO INCREASE ENERGY ACCESS

3.1 The heart of the energy problem for many developing countries is that, for some parts of energy systems, there are very large economies of scale. These can only be exploited through massive investment: to find and extract fossil fuels, to generate and distribute electricity, and to develop and market new renewable energy technologies.

3.2 Even with the assistance of international financial institutions, governments are unlikely to be able to raise

sufficient capital to meet the energy needs of their people. The issue facing many countries is therefore, how to make their energy sectors sufficiently attractive to private local and foreign capital to obtain sufficient investment, without compromising their ability to achieve other national objectives.

3.3 Various attempts to attract capital have now been tried with varying degrees of success, ranging from the issuing of bonds, selling of all or parts of the system, or contracting out parts of

Box 4: Innovative Finance Mechanisms and Partnerships for Energy Provision

- UNEP's African Rural Energy Enterprise Development (AREED) initiative, funded by the United Nations Foundation, 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.
- The Public-Private Advisory Infrastructure 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 three years and has attracted support from twelve donors including DFID. Current demands exceed resources and DFID is seeking to build on this success.
 - DFID launched the Emerging Africa Infrastructure Fund (EAIF), in January 2002, with an initial capital base of US \$300 million, in order to provide long-term debt finance for infrastructure in sub-Saharan Africa. The feasibility study for the facility showed an immediate need for US \$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).

the management function in return for a share of any efficiency gains. The added attraction of some forms of private capital is that they are associated with access to newer technology and particular expertise. While the need for competition to ensure reasonable prices and service is easily stated, its achievement has proved difficult in practice, particularly in small systems, or where regulatory capacities are limited. Lessons need to be drawn out from past experiences.

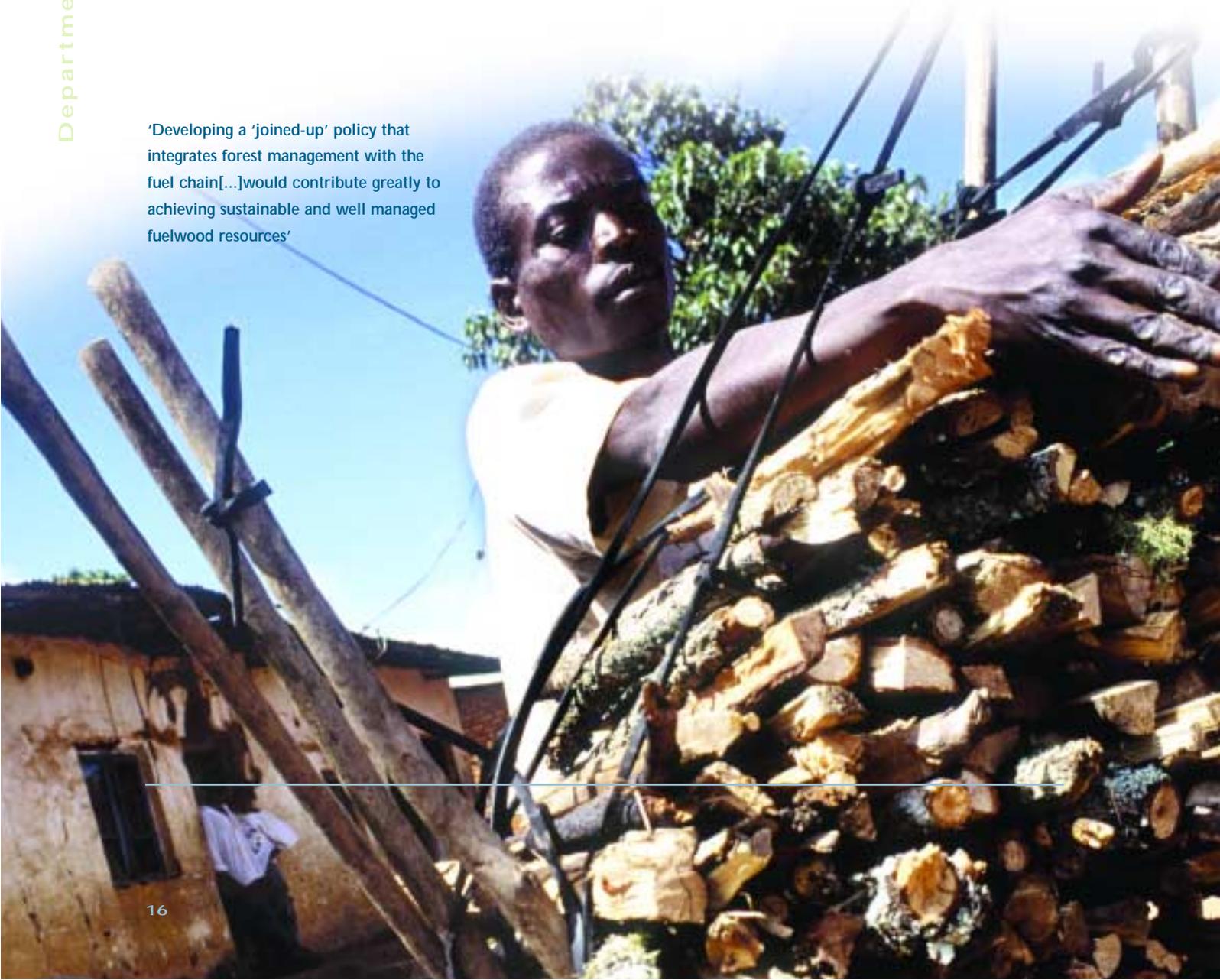
INCENTIVES FOR INVESTMENT

3.4 In recent years, the flow of private capital to the energy sector in developing countries has been relatively limited, particularly in the power sector. This is in part due to the inadequacy of the reform process, but clearly in many parts of the developing world, the 'country risk' far outweighs any favourable terms offered by any energy sub-sector. There is no lack of capital to invest: the challenge is how to make it attractive for private investors to invest in energy in developing countries.

3.5 A number of initiatives have been taken to encourage the flow of private capital, including finance mechanisms such as, the provision of grants, soft loans (low interest loans), loan guarantees, and revolving funds. 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. DFID is directly involved in funding the latter two partnerships described in Box 4.

3.6 Poor people on the whole have few affordable local energy options available to them. Privatisation and restructuring can lead to a wider choice of energy services on offer to businesses and households. Incentives are needed to encourage private sector involvement in energy service provision, particularly incentives that are seen to reduce the risk of investment, coupled with technical assistance to create a business environment with less red tape.

'Developing a 'joined-up' policy that integrates forest management with the fuel chain[...]would contribute greatly to achieving sustainable and well managed fuelwood resources'



4 MAKING SUBSIDIES AND OTHER POLICIES WORK FOR POVERTY REDUCTION

4.1 Subsidies are frequently a part of government policy towards the energy sector, but they can lead to great inefficiency. 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 rural communities.

4.2 Many attempts to increase poor people's access to improved energy services have involved subsidies. Given the weak purchasing power of poor people, subsidies will remain an important instrument. But over the years, subsidies have begun to destroy markets rather than make them. And they tend to be captured by the better off before they reach their intended targets.

4.3 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 (the main illuminant for the poor) were captured by the non-poor, since consumption of kerosene increases with income.³⁴ Blanket energy subsidies always benefit the elite more than the poor, since they use more energy than the poor.

4.4 A subsidy that is currently used in many developing countries is the lifeline tariff for electricity, through which consumers enjoy a subsidised tariff rate for consumption below a 'lifeline' level. It is important to ensure that this only covers the minimum electricity requirements, otherwise it will be too costly and largely benefit the non-poor.

SMARTER SUBSIDIES

4.5 Decisions over energy subsidies are highly politicised in many developing countries, and are therefore very difficult to reform. So-called 'smarter subsidies' should be targeted, transparent and pro-poor. In particular, they should:

- Follow pre-established rules that are clear and transparent to all parties.
- Focus on increasing access by lowering the initial costs (technical advice, capital investment) rather than lowering the operating costs.
- Provide strong cost minimisation incentives such as retaining the commercial orientation to reduce costs.
- Remain technologically neutral.
- Cover all aspects of the project including end use investments, particularly to encourage pro-poor end users.
- Use 'cross subsidies' carefully within the project to pay for lifeline charges or tariffs and other 'pro-poor' recurrent cost subsidies (for example, enable transfer from better off sections of the community, and commercial users to marginal connections).³⁵

PRO-POOR POLICY

4.6 In looking at policies and institutional arrangements that can make it easier for the poor to get access to energy services at reasonable cost, it is vital to understand fully the 'macro-micro links' between policy at the national (macro) level and how, in practice, it affects poor people at the local (micro) level. 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 since poor people were no longer able to afford kerosene and turned to fuelwood, putting pressure on resources.

4.7 One of the barriers to poor people getting access to energy is the initial cost of the technology or the meter. In China, all urban households in Guiyang are mandated not to use coal as domestic fuel; instead, they are required to use gas. This means that poor households that cannot afford the infrastructure for gas have to break the law.³⁶ In some cases, connection tariffs can also cause poor people to pay more for their electricity. For

³⁴ 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.

³⁵ Best Practice Manual: Promoting Decentralised Electrification Investment, ESMAP World Bank, 1999, Page 10.

³⁶ Development Planning Unit, UCL (2002) Draft Report, DFID Knowledge and Research project R766.

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 are thus charged commercial rates for their electricity, which they can barely afford.³⁷

4.8 Increases in electricity tariffs may also affect the poor by increasing the demand for other fuels that are substitutes for electricity. In addition, the increased demand can have knock-on effects in the market, raising the prices of other fuels, including biomass fuels, even though they are not used for the same purposes as electricity, but they 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.³⁸ Hence, taxing the rich may hurt the poor.³⁹

4.9 Policy-makers must understand the links between national policy and the real local level effects on poor people if they are to develop effective evidence-based policy.⁴⁰ It is important that the regulatory authorities work with both rich and poor to ensure a more equitable service.

4.10 With respect to traditional fuels, developing a 'joined-up' policy that integrates forest management with the fuel chain, linking ministries responsible for forests and those in charge of energy, would contribute greatly to achieving sustainable and well managed fuelwood resources. National forest programmes can provide a good framework, as they must be congruent with a country's socio-economic, cultural, political and environmental situation and be integrated with wider national economic development plans and land use policies. They have become secure platforms for dialogue with other sectors of the economy.

4.11 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.⁴¹ Revised policy and legislation is needed to improve legal access to energy services for the poor.



Lack of energy services at home means that children, often girls, have to provide for their families by fetching water, preparing food and collecting firewood or dung, and so are less able to go to school

³⁷ Future Energy Solutions (March 2002) Draft Report, DFID Knowledge and Research project R7661, 'Energy, Poverty and Sustainable Urban Livelihoods'.

³⁸ Barnes, D. (1995), 'Consequences of Energy Policies for the Urban Poor', Energy Issues, FDP Energy Note No. 7, The World Bank, Washington DC.

³⁹ Kebede, Bereket (March 2002), 'Poverty, Energy and the Millennium Development Targets', Centre for the Study of African Economics, St Antony's College, Oxford University.

⁴⁰ Evidence-based policy is developed with knowledge of the real effects the policy will have on the ground, as opposed to ideological policy, developed with little or no evidence of the true impact.

⁴¹ Future Energy Solutions (March 2002) Draft Report, DFID KaR project R7661, 'Energy, Poverty and Sustainable Urban Livelihoods'.

5 MAKING ENERGY SERVICES AFFORDABLE

ACCESS TO FINANCE

5.1 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.⁴²

5.2 Many poor people would be able to purchase energy services if they had access to appropriate credit.⁴³ They would also benefit if there was flexibility in the arrangements and timing for payment to fit their income patterns (for example, seasonally with crop harvests). 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.

BRINGING DOWN THE COSTS

5.3 While large amounts of subsidies goes to reducing the price of energy, decentralised energy options, particularly renewable sources, pose a particular barrier for poor people. All new renewable energy technologies have a common characteristic, namely that they have high initial capital costs and low recurrent (fuel) costs relative to fossil fuel based technologies. This is particularly true of photovoltaic electricity, hydropower and wind energy.

5.4 There is an important role for innovative financing to enable consumers to spread the high initial cost of energy conversion technology over the life of the equipment. This is particularly true for people who by definition have little to offer as collateral, and are unfamiliar with formal credit systems.

5.5 It is possible to reduce the initial capital cost of renewable energy technologies by producing them in larger volumes, thus taking advantage of economies of scale and reducing the unit cost. The G8 Renewable Energy Task Force recognised that the fastest way to increase demand and deployment of some renewable energy technologies is to increase their use in industrialised countries, thus bringing down the costs and

making them more affordable for developing countries.⁴⁴ The UK government has undertaken the renewables obligation and other measures to create a market estimated to be worth £1.5-2 billion by 2010, which should contribute to bringing down the technology costs for developing countries. Setting targets for increased deployment of new cleaner technologies in industrialised countries can help to encourage their uptake with poorer people in developing countries, as they are not then seen as second-rate technology.

BUILDING LOCAL CAPACITY

5.6 Many projects have failed in the past because of inadequate local skills and knowledge to select technology that is appropriate to the needs of poor people and to keep it in good running order. 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 these most efficiently.

5.7 Most poor people live in areas that lack access to infrastructure of all types (transport, communications as well as power). 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 sell spare parts or appliances. Investment in infrastructure is important to increase the provision of energy services to poor people, and sustain that access. Training local people to install, operate and maintain energy service technology is important to ensure their reliable operation. But there is a 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.

5.8 Building the local capacity to develop and manufacture energy technologies can also offer the possibility of bringing

⁴² Future Energy Solutions (March 2002) Draft Report, DFID Knowledge and Research project R7661, 'Energy, Poverty and Sustainable Urban Livelihoods'.

⁴³ Appropriate credit is credit loaned on terms that realistically mean it can be paid back, or for situations that would allow income generation, enabling loan repayment.

⁴⁴ Final Report of the G8 Renewable Energy Task Force, July 2001.

down the costs of energy services to the poor. This is particularly true for micro hydro turbines. DFID have recently funded research into locally manufactured pico hydro for affordable village power in Peru and Nepal, and small wind turbines for battery charging in Peru and Sri Lanka⁴⁵. Use of indigenous renewable energy resources can help reduce the cost of importing fuels and balance of payment problems. Particularly in remote areas, the use of locally available energy resources - such as charcoal and hydropower and other renewable energy resources - can help keep costs down by minimising fuel transport costs. The development of small-scale local coal extraction, with simple equipment and training, can also bring down the cost of energy technology to the poor.

Properly managed traditional fuel resources, such as woodlots, provide valuable energy resources and can help protect against erosion and improve soil fertility

⁴⁵ Projects R6846 and R7105 respectively. Details for these research studies and others that DFID have funded can be found on the DFID energy knowledge and research website: www.etsu.com/dfid-kar-energy/



6 THE WAY FORWARD: A NEW APPROACH TO ENERGY

AN HOLISTIC APPROACH

6.1 Energy in a development context is not about technology provision first; it is about understanding the role that energy services play within people's lives, and responding to constraints in improving livelihoods. Energy must be considered as one of the facets of service provision affecting the livelihood opportunities of the poor, and understood in terms of how the poor value and use it. The important issues to be considered reach beyond the technical concerns of energy technology (which have been the primary focus in 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.

6.2 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.

6.3 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 solutions that meet energy demand more efficiently and cost-effectively. Taking an holistic approach to energy service provision across sectors, rather than a project-based approach, should lead to more cost-effective energy services.

GREATER PARTICIPATION

6.4 People often focus on supply issues rather than on the benefits that energy can provide. Traditionally, development agencies funded big power projects, mainly in power generation. These undoubtedly made a contribution to economic growth, 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 of 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.

6.5 Current national and local level programmes clearly need to involve communities in the planning process, to ensure that energy services are appropriate, socially acceptable and sustainable (both economically and environmentally). Past experience indicates that bottom-up participatory planning increases the choice of the poor, with inflexible top-down planning favouring elites and the status quo. In some cultures, community or household ownership of the energy technology is important to assist in its proper care and operation; it can also help prevent vandalism and theft.

6.6 As with all development initiatives, it is crucial to take the local context 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, lack of benefits for the poor and environmental damage.

INTEGRATING ENERGY INTO DEVELOPMENT PROCESSES

6.7 The international approach to poverty reduction is being developed around the poverty reduction strategy process, which requires all countries to produce individual poverty reduction strategy papers (PRSPs) stating their development priorities. The requirement for energy services is not 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 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.

6.8 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. It 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 (which currently constitutes 96% of domestic energy supply). The recently approved World Bank energy for rural transformation initiative in Uganda, joins up the provision of energy services with health, education and other development goals.

6.9 The links between energy and poor people's lives are complex and, at times, indirect. As a result, the links are frequently overlooked altogether or only considered late on in the strategy or planning process. This often leads to less suitable energy services being supplied in isolation from other energy needs in the community. Ensuring sustainable energy is addressed in development strategies will help to achieve the MDGs. The failure to make this linkage was explicitly identified in the 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.'⁴⁶

6.10 The 2000 World Energy Assessment states: 'Many rural development activities – agriculture, transport, water supply,

education, 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.'⁴⁷

Co-operation and co-ordination of energy strategies 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.

UNDERSTANDING THE LINKS

6.11 The precise 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.⁴⁸ Some multilateral and bilateral agencies are beginning to recognise the importance of the role of energy in sustainable development and the important relationship between increasing energy use, greenhouse gas emissions and climate change. It is also 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.⁴⁹ 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 are set out in Box 5.

6.12 It is also important to take note of lessons from the past to ensure that mistakes are not repeated. Looking more closely at the success and failures of development projects, and analysing the role 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.

6.13 DFID's energy Knowledge and Research projects have shifted fundamentally in design, from a technology focus to

⁴⁶ UNDP (1997), 'Energy after Rio, Prospects and Challenges', Chapter 2 Energy and Major Global Issues, section 2.1.1.1.

⁴⁷ World Energy Assessment (2000), Chapter 10, p380 Rural Energy in Developing Countries, edited by Jose Goldemberg (Brazil), published by UNDP, UNDESA, WEC.

⁴⁸ As is the case with most infrastructure services, see DFID paper 'Making Connections: Infrastructure for Poverty Reduction'.

⁴⁹ 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.

Box 5: Towards a Better Understanding of the Role of Energy in Poverty Reduction

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

For example:

- To what extent can reduced indoor air pollution (IAP) contribute to improved health of women and children? While there is evidence to link IAP with increased risk of acute respiratory infection in children, there is limited evidence about what proportion of cases can be attributed to IAP. Evidence linking IAP with other diseases is inconclusive. While current interventions to reduce IAP, such as improved stoves, may have significant social and environmental benefits, there is currently no convincing evidence of their impact on health. A rigorous analysis of this issue is needed and further multi-disciplinary research is required, which examines the health outcomes and cost-effectiveness of interventions to reduce IAP.
- What opportunities are there for improving the quality of primary education through energy providing teacher access to the internet?⁵⁰
- Under what circumstances does access to better energy services facilitate or curb urban migration? 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 contribute towards 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 type of energy sector reform benefits the poor? DFID is part-funding some work in Orissa, India, looking at the benefits of rural power sector distribution reform on the poor.

one focusing on local capacity building and participatory approaches. Recently, a people-centred approach has come to the fore, with an understanding that Knowledge and Research 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 local pilot level to the national policy level, integrating them into country programmes. DFID is continuing to look at the links between energy and poverty through its Knowledge and Research programme.

6.14 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'. 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'.

6.15 Consideration of the positive environmental aspects of renewable energy sources must be balanced against meeting practically, quickly and efficiently the immediate energy needs of the poor with whatever energy services are accessible. 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. A number of targets for energy have been suggested.⁵¹ 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.

⁵⁰ The role of ICTs in development (with clear dependence on energy) is highlighted in the recent DFID Development Policy Department report. 'The Significance of Information and Communication Technologies for Reducing Poverty', Final report, October 2001, Programme for Policy Studies, Development Policy Unit, DFID.

⁵¹ The G8 Renewable Energy Task Force has an aspirational target of one billion additional people served with renewable energy in the next decade. The 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.

A NEW APPROACH TO ENERGY

6.16 Developing a new approach to energy, where energy services contribute fully to poverty reduction, and understanding the reality of the wider context, are important if energy is to be integrated into development processes. A new approach needs to be taken to ensure that energy underpins efforts to achieve the MDGs. This means:

- Taking a people-centred approach, reaching beyond the technical issues, to deliver energy services that meet peoples' needs and priorities.
- Ensuring that communities have a voice in the decision-making process on how to meet their energy needs.
- Working across all sectors to integrate energy more fully into development processes early on.
- Working at local, national and international levels, in order to develop pro-poor policies based on real evidence of the impact of energy on poor people.
- Taking an holistic approach to energy rather than a project-based approach.
- Building a deeper understanding of the links between energy and poverty reduction.
- Improving access to appropriate affordable energy services through: better management and regulation of the energy sector; increasing the efficiency of energy provision and use; increasing the choice of energy services; developing local capacity; encouraging partnerships and attracting private investment in energy services; providing access to finance at all levels and reducing costs; and designing smarter subsidies and other policies that work for poverty reduction.

Energy is an important component of a working health system. It provides light for clinics, refrigeration for vaccines and drugs, boils water, enables sterilisation of equipment and powers transport to medical centres



7 A ROLE FOR DFID

7.1 DFID works in partnership with governments, NGOs, the private sector, multilateral and bilateral development agencies and sees partnerships as the way forward in working more cross-sectorally to ensure energy issues are addressed holistically in order to contribute to the achievement of the MDGs.

7.2 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 national and local levels.

7.3 When working with the international community, DFID can have a powerful influence on both policies and institutions in support of wider development objectives. DFID is already contributing towards the development of a greater understanding of energy for poverty reduction through its involvement in the EU Energy Experts Group, playing a lead role in the World Bank co-ordinated Energy Trust Fund Programmes, collaborating with other donors both in country programmes and at a policy level internationally, and contributing to the development of the energy elements of PRSPs.

7.4 DFID will continue with this work and 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 will involve key actors within international and national agencies and governments, civil society and Whitehall. The focus will be on drawing together lessons from the past and ensuring future programmes are not condemned to making the same mistakes.

7.5 DFID will build closer links across Whitehall with the Foreign and Commonwealth Office, the Department for Environment, Food and Rural Affairs and the Department of Trade and Industry 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.

7.6 Working with a range of partners and building on existing work, DFID will undertake analysis of the incentives that attract private investment to energy services accessible to the poor and policies that facilitate or constrain the contribution of energy to the MDGs. This will include working at different levels of society with elites and poor people. Guidance on reaching the priorities of poor people through innovative mechanisms will be developed. This will be supported by targeted, demand-led research. DFID will analyse the potential of public-private partnerships within energy services (at national and local levels) and its effect on broader development goals, for example, transparency and budget reallocation.

7.7 DFID will build on existing activities at the local 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 will 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, as well as the contributions of energy to meeting the MDG targets on, among other things, poverty, health and environmental sustainability.

7.9 Through its country programmes, where appropriate, DFID will encourage local capacity building and the identification of opportunities for developing countries, in particular the least developed 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 will work to raise the profile and understanding of energy for poverty reduction, and encourage dialogue between energy and non-energy specialists, including:

- Communicating the key messages about energy for poverty reduction (using familiar language and linking to key issues, for example, PRSPs, MDGs, empowerment, health, education, water, environment, etc.), to non-energy and energy specialists, 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 opportune and appropriate 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.

Energy services reduce the time spent by women and children (especially girls) on basic survival activities, freeing up time for education or income-generating activities

ANNEX 1: MATRIX OF ENERGY AND THE MILLENNIUM DEVELOPMENT GOALS

Case studies that illustrate or support points made in the matrix are indicated in square brackets, for example, [CS1] represents Case Study 1. A list of case studies can be found in Annex 2.

IMPORTANCE OF ENERGY TO ACHIEVING THE GOAL		
Goal	Directly contributes	Indirectly contributes
<p>1) Extreme poverty and hunger energy services</p> <ul style="list-style-type: none"> To halve, between 1990 and 2015, the proportion of the world's people whose income is less than one dollar a day. To halve, between 1990 and 2015, the proportion of people who suffer from hunger. 	<ul style="list-style-type: none"> Access to reliable enables enterprise development [CS1] Lighting permits income generation beyond daylight hours Increased productivity from being able to use machinery [CS4] 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. The majority (95%) of staple foods need cooking before they can be eaten and need water for cooking. Improving productivity throughout the food chain (in tilling, planting, harvesting, processing, transport etc.) Reduction of post harvest losses through better preservation (for example, drying and smoking) also through chilling/freezing 	<ul style="list-style-type: none"> 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 Efficient energy systems reduce costs, help create sustainable businesses/jobs and economies and underpin the social fabric of a region [CS9, CS3, CS6] Privatisation of energy services can help free up government funds for social welfare investment [CS10] 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) Energy for irrigation helps increase food production and access to nutrition. Clean water helps improve health. Increased health and nutrition open up opportunities for employment and income generation. 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
<p>2) Universal primary education</p> <ul style="list-style-type: none"> To ensure that, by 2015, children everywhere will be able to complete a full course of primary schooling. 	<ul style="list-style-type: none"> 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. 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 Lighting in schools allows evening classes and helps retain teachers, especially if their accommodation has electricity Electricity enables access to educational media and communications (ICTs) in schools and at home that increase education opportunities and allow distance learning 	<ul style="list-style-type: none"> Access to energy provides the opportunity to use equipment for teaching (overhead projector, computer, printer, photocopier, science equipment) Modern energy systems and efficient building design reduces heating/cooling costs and thus school fees, enabling poorer families greater access to education [CS2]
<p>3) Gender equality and women's empowerment</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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) Good quality lighting permits home study Electricity enables access to educational media and communications (ICTs) in schools and at home that increase education opportunities and allows distance learning 	<ul style="list-style-type: none"> Lighting in schools allows evening classes and helps retain teachers especially if their accommodation has electricity. Street lighting improves women's safety Reliable energy services offer scope for women's enterprises [CS1, CS4]

IMPORTANCE OF ENERGY TO ACHIEVING THE GOAL		
Goal	Directly contributes	Indirectly contributes
4) Child mortality <ul style="list-style-type: none"> To reduce by two-thirds, between 1990 and 2015, the death rate for children under the age of five years 	<ul style="list-style-type: none"> Indoor air pollution contributes to respiratory infections that account for up to 20% of the 11 million deaths in children each year (WHO 2000, based on 1999 data) Gathering and preparing traditional fuels exposes young children to health risks and reduces time spent on child care Modern energy can be safer (fewer burns, accidents and house fires) [CS4] 	<ul style="list-style-type: none"> Provision of nutritious cooked food, space heating and boiled water contribute towards better health Electricity enables pumped clean water and purification Cold chain provision allows access to vaccinations [CS7]
5) Maternal health <ul style="list-style-type: none"> To reduce by three-quarters, between 1990 and 2015, the rate of maternal mortality. 	<ul style="list-style-type: none"> Energy services are needed to provide access to better medical facilities for maternal care, including medicine refrigeration, equipment sterilisation and operating theatres 	<ul style="list-style-type: none"> Excessive workload and heavy manual labour (carrying heavy loads of fuelwood and water) may affect a pregnant woman's general health and well-being. Energy can help produce and distribute sex education literature and contraceptives ICTs for long distance learning and 'distance medicine' requires a power supply Provision of nutritious cooked food, space heating and boiled water contribute towards better health and all need energy [CS7]
6) HIV/AIDS, malaria and other major diseases <ul style="list-style-type: none"> By 2015, to have halted and begun to reverse: <ul style="list-style-type: none"> the spread of HIV/AIDS the scourge of malaria the scourge of other major diseases that afflict humanity. 	<ul style="list-style-type: none"> Electricity in health centres enables night availability, helps retain qualified staff and allows equipment use (for example, sterilisation, medicine refrigeration) Energy for refrigeration allows vaccination and medicine storage for the prevention and treatment of diseases and infections Safe disposal of used hypodermic syringes by incineration prevents re-use and the potential further spread of HIV/AIDS [CS8] 	<ul style="list-style-type: none"> Energy is needed to develop, manufacture and distribute drugs, medicines and vaccinations Electricity enables access to health education media through ICTs
7) Environmental sustainability <ul style="list-style-type: none"> To stop the unsustainable exploitation of natural resources; and To halve, between 1990 and 2015, the proportion of people who are unable to reach or to afford safe drinking water 	<ul style="list-style-type: none"> 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 Energy can be used to purify water or pump clean ground water locally, reducing time spent collecting it and reducing drudgery. Traditional fuel use contributes to erosion, reduced soil fertility and desertification: this can become more sustainable through substitution, improved efficiency and energy crops Using cleaner, more efficient fuels will reduce greenhouse gas emissions, which are a major contributor to climate change [CS3] 	<ul style="list-style-type: none"> Clean energy production can encourage better natural resource management, including improved water quality [CS6] National sustainability aided by greater use of indigenous renewable energy sources instead of imported fossil fuels as economy grows Rural energy services enable non-farm-based enterprise and processing of non-timber forest products Efficient use of energy helps to reduce local pollution and improve conditions for poor people [CS5, CS4]

ANNEX 2: REFERENCE 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 Artisansaux 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
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', Salome Misana & Gail V.Karlsson (eds). 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: www.seamegypt.org
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 Number	Description	Source of information
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 ' Fuelwood 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. www.dmu.ac.uk/mwi email: djpicken@iee.org.uk edtc@globalnet.co.uk
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-privatisation – public service delivery through private micro-enterprise', Small Enterprise Development, volume 12 number 2, pp. 11-19, June 2001. 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.

As well as its headquarters in London and East Kilbride, DFID has offices in many developing countries. In others, DFID works through staff based in British embassies and high commissions.





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