

Will tomorrow be brighter than today?



**Addressing gender concerns in energy
for poverty reduction in the Asia-Pacific region**



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Regional Energy Programme for Poverty Reduction
UNDP Regional Centre, Bangkok

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Foreword

Energy is a key factor in economic development and since women often have a strong interest in energy issues, policy programming needs to mainstream gender concerns as a central element of project design. Energy provision matters for women's productive and reproductive responsibilities within and outside their households, including health and environmental issues, time-use efficiency and income generation.

Men and women frequently have different interests in terms of energy use: men often tend to emphasize the benefits of saving money on energy costs while women tend to emphasize the benefits of better health and time savings. In many developing countries, women continue to play a key role in household energy use. They are usually the gatherers of fuelwood, charcoal and dung for cooking and heating, with the added workload of travelling greater distances to collect it when supplies are limited, and bearing disproportionate health side-effects of indoor pollution from domestic tasks such as cooking. Increasing access to cleaner, modern energy sources such as electricity can make a significant difference in women's lives in terms of their health and time-use, enabling other endeavors such as education and income generation. Women can have greater resources for pursuing income generating activities that fit within their household reproductive roles.

The problem at the policy level is not just the absence of women's concerns in energy policy making; it is also the obvious absence of women in policy making influencing programmatic content that limits gender mainstreaming. Decisions remain largely gender neutral, and fail to enhance women's practical or strategic gender needs, thereby limiting the success of energy policies. First it must be recognized that men and women have different energy needs and priorities, and secondly to develop policies and technologies to respond to these needs. Therefore, a systematic gender assessment and documentation of selected energy projects in the region, and the dissemination of information relating to these programmes is an important aspect of this effort.

This report is an initiative of the Regional Energy Programme for Poverty Reduction (REP-PoR), a programme which focuses on enhancing equitable access to appropriate, reliable and affordable energy services so as to reduce human and income poverty. In examining the gender dimension of energy access and provisioning, its use and impact, the report highlights the gender concerns in the Asia-Pacific region, and compels policy makers, Governments, civil society organisations, and indeed people themselves, to view energy issues from a different prism. It is to be commended for its approach and for bringing the gender – poverty – energy issues centre stage, as well as for the many actionable recommendations it puts forward, which can serve as a valuable blue print for countries in the region.

The success of the Grameen programme in Bangladesh, the community owned micro-hydro system in the Solomon Islands, the Cambodia Fuelwood Saving Project (CFSP), the Biogas Sector Partnership (BSP) in Nepal are some of the initiatives that vindicate the view that small interventions can make a big difference. The focus has to be on developing a strategy for equitable access for the poor, especially women, to energy.



Hafiz A. Pasha
UNDP Assistant Administrator and Regional Director
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Preface

Six years have passed since the signing of the historic Millennium Declaration. As nations are making efforts to reach the Millennium Development Goals (MDGs), the role of energy as a critical input for development remains to be addressed adequately and appropriately. Conventional energy policies have not only neglected the role of energy as an input to development, they have ignored the critical role and concerns of women in energy systems, particularly in the rural areas. It is well known that access to reliable and affordable energy services helps improve livelihoods, productivity and incomes. It enhances living standards through quantitative as well as qualitative impacts on provision of services in the fields of health, literacy, education, water and sanitation. Therefore, steps need to be taken, on a priority basis, to extend equitable access to affordable, clean and reliable energy to all nations and communities.

The United Development Programme (UNDP) is committed to assisting developing countries in the above effort and thus contributing to poverty reduction and human development. As the campaign manager and scorekeeper of the MDGs, the UNDP has adopted a strategy of mainstreaming gender concerns in all projects and programmes, including those related to the nexus between energy, poverty, and the MDGs.

Recognizing the critical need to support countries in extending the access of modern energy services in a cost-effective manner to the poor, the UNDP, through its Regional Energy Programme for Poverty Reduction (REP-PoR), commissioned rapid gap assessments in energy access at the national level for 30 countries in the Asia and Pacific regions. The primary aim of these assessments was to identify gaps in linking energy access to poverty reduction, and to identify steps necessary to bridge the gaps. The initial framework for the assessments was developed through two sub-regional consultation meetings held in Bangkok, Thailand in August 2005 and in Apia, Samoa in September 2005, respectively. These were

followed by in-country consultative processes. The framework was finalized in March 2006. It reiterated the relevance of gender concerns and their linkage to energy and poverty issues that need special national and sub-national development planning strategies. In the following pages we discuss the policy gaps with regard to gender and energy access and propose a set of pragmatic recommendations.

The country-specific rapid gap assessments led to two sub-regional assessments focusing on energy and gender issues, one each for the Asia and Pacific regions. The two assessments complemented each other in regard to the central message. Both stressed that improved access to energy services would contribute towards gender equality and empowerment of women besides reducing poverty and improving the overall development of poor areas.

Therefore, it was considered appropriate to combine the two reports into the Asia-Pacific regional report, titled *Will Tomorrow be Brighter than Today?: Addressing gender concerns in energy for poverty reduction in the Asia-Pacific Region*.

It is hoped that this publication will strengthen and enrich the knowledge base in this area and help development practitioners, energy planners, community groups and gender experts in making informed policy judgments on gender-sensitive energy services projects in the pursuit of MDGs.

A handwritten signature in dark blue ink, reading "Elizabeth Fong". The signature is fluid and cursive, with the first name "Elizabeth" and the last name "Fong" clearly distinguishable.

Elizabeth Fong
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A handwritten signature in blue ink, appearing to read 'Marcia V.J. Kran', with a stylized flourish at the end.

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Acronyms

AKRSP	Aga Khan Rural Support Programme
APPROTECH ASIA	Asia Alliance of Appropriate Technology Practitioners
ASTAE	Asia Alternative Energy
BSP	Biogas Sector Partnership
CFSP	Cambodia Fuelwood Saving Project
COPD	chronic obstructive pulmonary disease
CRT	Centre for Rural Technology
DALY	disability-adjusted life years
DC	direct current
DDC	District Development Committee
ECF	Energy Conservation Fund
EnPoGen	energy, poverty and gender
ENSIGN	Energy Services for Income Generation
GDI	Gender-related Development Index
GDP	gross domestic product
GEM	Gender Empowerment Measure
GVEP	Global Village Energy Partnership
HDI	Human Development Index
IBRD	International Bank for Reconstruction and Development
ICS	improved cook stoves
LPG	liquefied petroleum gas
MoAD	Ministry of Atolls Development
MDG	Millennium Development Goal
MEEW	Ministry of Environment and Energy and Water
MFI	microfinance institutions
M&E	monitoring and evaluation
NGO	non-governmental organization

PEG	Pacific Energy and Gender Network
PICs	Pacific Island Countries
PIFS	Pacific Islands Forum Secretariat
PNG	Papua New Guinea
PREFACE	Pacific Rural Renewable Energy France-Australia Common Endeavour
PSL	Prokaushali Sangsad Limited
RCB	Regional Centre Bangkok (UNDP)
REDP	Rural Energy Development Project
REP-PoR	Asia-Pacific Regional Energy Programme for Poverty Reduction (UNDP)
RET	renewable energy technology
SEEDS	Sarvodaya Economic Enterprise Development Services
SELCO	Solar Electrical Light Company
SHG	self-help group
SNV	Netherlands Development Organisation
SPV	solar photovoltaic
UNDP	United Nations Development Programme
UNIFEM	United Nations Development Fund for Women
UNFPA	United Nations Population Fund
VBARD	Viet Nam Bank for Agriculture and Rural Development
VDC	Village Development Committee
VP	Village Phone
VWU	Viet Nam Women's Union
WHO	World Health Organization

Executive summary

Gender, energy and poverty

Approximately 1.6 billion people in the world do not have electricity. About 2.4 billion rely on traditional fuels, such as wood, charcoal, dung and agricultural residues for cooking and heating. Grid-based electrical power does not reach many rural and poor urban areas in developing countries, nor is there adequate distribution of gas or other cooking and heating fuels.

Access to affordable energy services is an essential prerequisite for achieving economic growth and poverty reduction. Energy services are linked to well-being and have the potential to impact on almost every area of human life, from increased economic activity to improved child literacy, safe drinking water and women's empowerment. The bundling of services like water, sanitation and education with electricity has disproportionately larger benefits; the whole is substantially larger than the sum of the parts. The equitable, diversified and expanded access to energy can improve productivity and income for everyone, reduce inequities and substantially change the way people live, especially the poor and the disadvantaged and women in particular.

As women are primarily responsible for household energy procurement and management, and because these tasks are invisible in national energy accounts, energy poverty has a specific and strong gender dimension. As part of this gender review, two variables – access to electricity and the cooking energy mix – have been mapped because lighting, heating and cooking together constitute the bulk of energy consumption (in rural areas, cooking predominates).

In 2000, an estimated 1.1 billion people subsisted on incomes below US\$1 a day, across the world. More than 60 percent of these people lived in the Asia-Pacific region. In most countries of the region, the number of poor women is higher than that of poor men. In addition, women's participation in the workforce in South and South-east Asia is largely restricted to the informal economy. Gross domestic product (GDP) per capita for women in the region is extremely low and is often less than half and sometimes only one-third of the GDP for men.

Energy services are linked to well-being and have the potential to impact on almost every area of human life

Rural electrification

In all the Asia-Pacific countries (and in developing countries in general), rural electrification continues to be the largest rural energy programme, both in terms of investment as well as coverage. The main issues in rural electrification are: the limited expansion of the grid in most countries, especially to remote areas; erratic and unreliable power supply, leading to dependence on multiple fuels for lighting; and high price (in most countries), making electricity unaffordable for the very poor. Furthermore, the unsuitability of electricity to address cooking energy needs in most countries and the continued reliance on biomass fuels mean that energy programmes seldom impact women's lives in any significant way.

The poor – particularly poor women – are often excluded from the benefits of electricity

Most of the benefits from rural electrification go to wealthier people. Once connected, the amount of electricity consumed and therefore the benefits obtained depend on the ability to purchase electrical equipment, light fixtures, televisions, fans, water heaters, water pumps or motor-driven machines. Thus, the poor – particularly poor women – are often excluded from the benefits of electricity.

There is an implicit assumption that the benefits of electricity are gender neutral; however, this is a misplaced notion as women perceive the need for and use of electricity quite differently from men. Decisions regarding the use of electricity are often taken by men, which means that women may or may not benefit from the provisioning of electricity.

The role of the public sector in electricity provisioning is likely to diminish in the future, except as a regulator and facilitator. Liberalization of the petroleum markets in most countries of the region has meant that governments exercise less control over pricing, provisioning of services and supplies in the petroleum sector. These developments pose a challenge for energy provisioning in Asia and the Pacific; whether they will lead to greater efficiency and increased access for the poor, especially for poor women, is not yet clear.

Smoky kitchens and other health concerns

More than half the population in developing countries still relies on traditional biomass fuels for cooking and heating and are subject to all the health risks posed by their combustion. Women are exposed to a

variety of health hazards from cooking over poorly ventilated indoor fires, including respiratory infections, cancers and eye diseases. Globally, indoor air pollution accounts for 1.6 million premature deaths per year (WHO 2005). Exposure to indoor air pollutants enhances the risk of lower respiratory infections in children and pulmonary disease in women. In addition, increasing deforestation means that women now have to traverse longer distances for fuel wood and water, leading to postural defects and other health risks.

Women are exposed to a variety of health hazards from cooking over poorly ventilated indoor fires

In most countries covered by this study, the primary biomass fuel used is wood, with the exception of Bangladesh, where agricultural residues are the predominant fuel. Countries like Cambodia, Lao PDR and Sri Lanka rely almost entirely on wood as a source of biomass.

Relatively simple, inexpensive stoves can reduce the fuel needed for cooking by as much as 30 percent and ease pressure on land and conserve scarce income. Other benefits to women are the time saved in fuel wood collection and cooking, a reduction in the drudgery of household chores, and a decline in indoor air pollution, which leads to better health for women and children.

In the foreseeable future, the probability of eliminating this dependence on traditional energy sources (especially fuel wood) in rural areas is low. In a few areas, the supply of conventional commercial energy and/or decentralized alternatives like biogas, solar power and other non-conventional energies (for lighting) may emerge, but these are unlikely to replace the dependence on traditional fuels. As a result, biomass will continue to be the fuel of 'first choice' in most of Asia and the Pacific.

Improving efficiency and reducing health risks for women

The energy sector can play a significant role in reducing environmental damage and its harmful consequences by introducing renewable energy sources, supplying modern cooking fuels at affordable prices, substituting cleaner fuels for dirty ones, and increasing energy efficiency.

These interventions in turn will help to improve women's lives by reducing the time spent foraging for biomass, providing women with more time (which may be used for other household chores, leisure or income-generating activities), decreasing the risk of pulmonary disease,

and improving energy efficiency, leading to a reduction in energy costs (in urban areas).

In most Asia-Pacific countries, women's energy needs have been addressed primarily through special programmes like the introduction of more efficient and less smoky stoves, biogas plants and solar cookers. Renewable energy technologies (RETs) like biogas and improved cook stoves (ICS), both of which have demonstrated gender benefits that are well documented, have failed to make a significant impact in country programmes (barring exceptions like China). Even in the PICs, where there is substantial potential for the development of renewable energy sources, the share of renewable energy in total energy supply remains small.

Credit and microfinance to meet energy needs

The availability of credit and finance is critical to enabling women's participation in using improved energy supplies

The availability of credit and finance is critical for enabling women's participation in using improved energy supplies. The promotion of energies/systems for income-generating purposes and the adaptation of a credit scheme to reduce down-payment requirements and extend the payment periods could expand the market for these systems, bringing down costs and making them more accessible to women and less-affluent borrowers.

Gender concerns missing in energy policy and planning, constraints to women's enterprise

The absence of gender-sensitive project planning, monitoring and evaluation (M&E) emerged as a common issue in all the Gap Assessment Country Reports.¹ Energy policies require gender mainstreaming, a recognition of the impact of energy on women and an articulation of the issues that affect women. In response to this understanding, appropriate policies and interventions need to be designed.

Within the Asia-Pacific region, women operate a large number of micro and small-scale enterprises, particularly in the informal sector. These enterprises tend to be concentrated around a narrow range of activities such as food-processing industries and service-sector activities, with relatively low rates of return as compared to men's activities. Women's enterprises are also adversely affected by the social and practical

¹ The Gap Assessment Country Reports were commissioned by the UNDP's Regional Energy Programme for the Asia and Pacific. The reports were conducted in 15 Asian countries and a regional assessment of 15 Pacific Island Countries.

constraints related to ownership and control over productive resources. The ability of poor women to generate livelihoods is also constrained by high marketing costs. In addition, the informal nature of these industries makes it difficult for women to access credit, equipment, market information, technical training and other support services.

Conclusions

There is a need to extend energy provisioning across most of Asia and the Pacific, both in electricity and in cooking fuels, including liquefied petroleum gas (LPG), kerosene and RETs. The high complementarities between energy and development, energy and gender equity, and the impact energy has on other basic services like water and sanitation, make energy pivotal to poverty eradication strategies and measures directed at achieving the MDGs.

- If the current situation continues, the number of people without access to electricity in 2030 will be around 1.4 billion (only 200 million less than at present), and the number of people who rely on traditional biomass for cooking fuel needs will be 2.6 billion (more than at present).
- The lack of disaggregated data regarding energy use, supply and impact by gender is a major hindrance for applying methods and tools for incorporating a gender perspective in project design and implementation.
- The provision of energy and whether or not women are able to take advantage of it in terms of greater incomes, increased leisure, reduced drudgery and/or access to education depends on a number of factors, including social and cultural attitudes.
- Inherent inequities, such as between urban/rural areas, rich/poor people and men/women, need to be recognized in strategy planning and design. Any strategy aimed at reducing poverty, especially poverty in women-headed households, must have a built-in energy component to ensure improved well-being, opportunity and access.
- It is important for people and governments to recognize the hazards that result from use of inefficient biomass fuels and to

Any strategy aimed at reducing poverty must have a built-in energy component to ensure improved well-being

Energy policy needs to recognize women's gender-specific needs

develop sustainable energy programmes and provide more efficient stoves and cleaner fuels to protect the health of women and children.

- Energy policy needs to recognize women's gender-specific needs for water-pumping, agricultural processing, security, work productivity and health, as well as the trade-offs between their domestic and income-generating activities.
- Access to credit, extension and training for women is critical if access to energy is to impact women's lives. Poor women find it difficult to access these resources.
- Research shows that a participatory approach is the key to success. A project is more likely to succeed if it involves all stakeholders in both the conceptualization and design stages and continues to do so through the implementation and evaluation stages as well.

The way forward

- **Develop and use poverty- and gender-sensitive project planning and M&E** incorporating participatory approaches, tools and techniques throughout the project cycle to ensure that all stakeholders are properly accounted for.
- **Build capacities on gender mainstreaming at the national and local level** focusing on increasing awareness, knowledge and skills of development practitioners to enable them to integrate gender concerns into energy policies, programmes and projects.
- **Provide technical assistance to mainstream gender issues into national energy projects** in terms of guidance in reviewing project documents; developing a gender mainstreaming strategy; and ensuring that planning and monitoring records and reports disaggregate participation of and the effect on men and women, at both the project planning and the evaluation stage. Further, it is essential to ensure that this feedback is used to adjust programme strategy.

- **Recognize sub-regional variations** reflecting the great diversity of the Asia-Pacific region, in terms of its natural resource base and energy consumption patterns, as well as in socio-cultural systems – including gender relations. Strategies need to be designed to factor in the unique conditions that prevail in a particular country, integrating at each stage the issues that impact women.
- **Disseminate the information** obtained through systematic gender assessment and documentation of selected energy projects in the region through the existing networks, especially information relating to alternate institutional models in the energy sector.
- **Advocate policies for creating enabling conditions for women's enterprises.** Interventions should encompass a bundle of services that provide women with choices in terms of appropriate energy technologies and enable them to access those technologies and fuels, that are best suited to their requirements. Policy advocacy is also necessary at the regional and country level to encourage the establishment of women's enterprises, supported by adequate training and credit facilities.

Policy advocacy is also necessary at the regional and country level to encourage the establishment of women's enterprises

1

Gender, energy and poverty



Gender,² energy and poverty

1

Gender, energy and poverty

It is simply unacceptable that such widespread energy deprivation, with its consequences for nutrition, health, education, welfare and environment, should continue into the next millennium.

– WEC/FAO, *The Challenge of Rural Energy Poverty in Developing Countries*, 1999

Energy is often viewed as the pivot of growth, the availability of which is an essential element of any strategy of change and advancement. Energy security³ is a goal that nation states aspire to because energy is an enabler and has the potential to bring change. Although energy is not explicitly listed as a Millennium Development Goal (MDG), it is now recognized that the provision of energy services is critical to development – and for achieving the MDGs.

Access to modern sources of energy (including electricity) helps in expanding choices for individuals and assists them in capability expansion. Modern energy services are an essential element of developing the enabling conditions that can allow a country to meet the MDGs (Modi 2005). Energy is no doubt an enabler – an enabler not only of growth, but of opportunity as well. With the benefit of development experience, it is possible to unequivocally state that energy is essential not only for growth, but for the attainment of the key goals that have been set: the eradication of poverty and inequity, and the provision of opportunity in equal measure to all.

Energy need not however be seen only as an input to production and an ingredient for growth. Equitable, diversified and enlarged access to energy can in fact improve productivity and income at all levels, reduce inequities and substantially change the way people live, particularly the poor and the disadvantaged. It is for this reason that attention needs to be focused on minimum service provisioning and on issues of access, quality and supply.

The provision of energy services is critical to development – and for achieving the MDGs

² Gender refers to the socially constructed roles rather than biologically determined roles of men and women as well as the relationships between men and women in society at a specific time and place (UNDP 2004c). It refers to the rules, norms, customs and practices by which biological differences between males and females are translated into socially constructed differences between men and women, boys and girls (Kabeer 2003).

³ Energy security may be defined as the lack of vulnerability of national economies to volatility in volume and price of imported energy. Security of energy supply has economic, social and political dimensions, and the social and political dimensions are more difficult to capture.

Access to electricity, the most common form in which energy is increasingly available, is particularly skewed. Rich countries consume more energy than poor countries (UNDP 2005a). Poor people inevitably make do with less energy services, or even none, and are faced with problems of poor quality, irregular supply and high price. Within the broad grouping of the poor, the disadvantaged and the marginalized make do with even less (Clancy et al. 2003).

It is important also to view poverty not just within the narrow prism of income. Viewed in the context of deprivation, energy can be a liberator and a catalyst, a means of empowerment, providing opportunity, security and an instrument to confront inequity. Energy has the potential to change the lives of men and women in irreversible ways. The provision of energy services can help people living in poverty to remedy at least two of the pervasive problems that keep them in poverty – their low productivity and their limited range of productive options.

1.1 Poverty and energy: energy has the power

In 2000, an estimated 1.1 billion people globally subsisted on incomes below US\$1 a day. More than 60 percent of these people lived in the Asia-Pacific region: 432 million (39.2 percent) in South Asia and 261 million (23.4 percent) in East Asia and the Pacific (UNDP 2004b).

In most countries of the region, the number of poor women is higher than that of poor men (IFAD 2002). This is not un-representative of the world; some estimates put the proportion of women at as much as 70 percent of the world's poor. Women-headed households in rural areas form a significant proportion of the poor (UNDP 2004a). Furthermore, women in poverty are more challenged than men. They find it more difficult to break away since they have less access to resources than men and suffer from severe social deprivation (IFAD 2002).

Women in poverty are more challenged than men – they find it more difficult to break away since they have less access to resources

Access to affordable energy services is an essential prerequisite to achieving economic growth and poverty reduction. Approximately 1.6 billion people in the world do not have electricity. About 2.4 billion rely on traditional fuels, such as wood, charcoal, dung, and agricultural residues, for cooking and heating (Saghir 2006). Grid-based electrical power does not reach many rural and poor urban areas in developing countries, nor is there adequate distribution of gas or other cooking and heating fuels.

Energy services also cost the poor more because using fuels such as wood and kerosene for cooking and lighting is less efficient than using modern fuels

Energy also has an equity dimension: poor households use less energy than wealthier ones in absolute terms and spend a higher proportion of their income on energy than higher-income households. For example, in Hyderabad (India), poor households spend 10 to 15 percent of their income on energy, while wealthy households spend less than five percent (ESMAP 1999, quoted in Saghir 2006). Poor people in rural areas spend a smaller share of their income on energy, but it is still a significant proportion. In rural India, poor households spend as much as eight percent of their incomes on energy for lighting, most of it on kerosene (ESMAP 2000). Energy services also cost the poor more because using fuels such as wood and kerosene for cooking and lighting is less efficient than using modern fuels. In addition, the poor usually buy fuel wood and charcoal in small amounts. When the transaction costs are taken into account, energy for cooking often ends up being more expensive for poor people than for the better-off (Saghir 2006). Unlike the rich, poor people find it hard to make even the smallest investments and may therefore end up using less-efficient equipment and/or fuel, often leading to high costs for the households, both in terms of time and money (Clancy et al. 2003).

In energy too, the quandary of women is no exception to the norms that govern gender relationships and status. In most countries in the region, biomass collection, fuel wood collection and the drying of agro-residues are all tasks that are inevitably left to women. Given the primary responsibility of women for household energy procurement and management (and the invisibility of these tasks in national energy accounts), energy poverty⁴ acquires a specific and strong gender dimension.

The time and physical effort expended by women and girls in gathering fuel and carrying water seriously limits their ability to engage in educational and income-generating activities. Literacy rates and school enrolment levels, for example, are substantially different for men and women (UNDP 2004a). Since the burden of household chores and responsibilities is unequally shared, women have limited – if any – prospects of carving out time and resources for themselves. In addition, the use of biomass has a number of adverse repercussions, on health, on livelihoods and on the time available for women to engage in other activities. Thus, any improvement in the access to energy would have a dramatic impact on the lives of women and girl children.

⁴ Energy poverty means the absence of sufficient choice in accessing adequate affordable, reliable, clean, high-quality, safe and benign energy services to support economic and human development – World Energy Assessment, 2000.

Energy services are linked to well-being and have the potential to impact on almost every area of human activity, from increased economic activity, to improved child literacy and safer drinking water. Research suggests that while increased access to more convenient energy supplies may not be a sufficient condition for development, it may well be a necessary condition.

At the micro level, it is empirically difficult to measure the impact of small investments in energy services on poverty and to establish causal links; however, there are strong reasons to advocate that energy interventions do indeed produce positive benefits. This impact is likely to vary with the presence of complementary inputs. For instance, the bundling of services like water sanitation and education with electricity has disproportionately larger benefits; the whole is substantially larger than the sum of the parts (IDS 2003). An experience from outside the region that has demonstrated significant gains is the Multi-Functional Platform in Mali. The platform, which is a simple diesel engine that can power different tools, has reduced workloads, increased productivity and income earnings, and has impacted positively on women and girls' educational performance as well (see Box 1). The Mali example shows that a simple intervention has the potential to deliver multiple benefits and illustrates the linkages between gender, energy and poverty.

Energy services are linked to well-being and have the potential to impact on almost every area of human activity

Box 1: Multi-Functional Platform: multiple gains from a single intervention

The Multi-Functional Platform facility was first started in the 1990s in Mali. Today, more than 400 such platforms are operational in more than 70 villages across Mali, and the programme has been extended to Burkina Faso, Senegal, Guinea and Cote d'Ivoire. The platform consists of a diesel engine to which a variety of end-use equipment can be attached, such as grain mills, battery chargers, oil presses, welding machines and carpentry tools. Its advantage is its simplicity, sturdiness and multiple uses.

The platform has freed up about six hours of time every day for women and has meant an increase of at least 50 percent in their income.

A considerable amount of time that was earlier expended in the crushing of shea nuts to produce butter is now saved. The production of shea butter has tripled, as has the annual income. Domestic chores such as cereal grinding and water carrying have also been simplified, and the benefits include expanded economic opportunities, better education (since more time can be devoted to studies) and empowerment.

This simple intervention has meant the provision of affordable energy services, the creation of income-generating activities, and increased free time for the women.

Sources: Burn and Coche (2001) and UNDP (2004a)

Equality between men and women is therefore essential for lowering poverty and improving health in developing countries

1.2 The importance of a gendered approach

Energy poverty has much in common with other forms of the poverty. There is deprivation, hardship and inequity, the last acutely impacting on women. It is at the level of household usage that the impact of energy poverty and the benefits of increased access to and provisioning of energy services for women are most apparent.

A recent study by UNICEF says that inequality at home (between men and women) leads to poorer health for the children and greater poverty for the family. Equality between men and women is therefore essential for lowering poverty and improving health, especially the health of children, in developing countries.

The study shows that where women are excluded from family decisions, children are more likely to be under-nourished. Where men control the household, less money is spent on health care and food for the family, resulting in poorer health for the children. The same study points out that increasing employment and income-earning opportunities for women would increase women's household power. For example, it was found that whoever has the greater share of household income and assets decides whether those resources will be used to meet family needs. There would be 13 million fewer malnourished children in South Asia if women had an equal say in the family (UNICEF 2006).

According to the study, women's involvement in government tends to result in policies that are focused on children and families. However, women are under-represented in legislatures around the world, due to lower levels of education, social attitudes and their greater work burden. Thus when the income earning capacities of women are augmented through energy provisioning and services, the benefits accrue to the family as a whole and to children in particular. These gains are manifested in better education, improved nourishment and better health care.

While increased income in the hands of women leads to better care of the family as a whole and for women themselves, there is another important reason for emphasizing a gendered approach to energy provisioning and services. This is "the need to challenge and dismantle the structures of men's power and privilege, and end the cultural and social permission for acts of violence that is often prevalent in patriarchal societies". In this context it is argued that it is essential to involve men to work in

cooperation with women to reshape the gender organization of society, in particular, the institutions and relations through which we raise children. This requires more emphasis on the importance of men as nurturers and caregivers, involved in the raising of children in positive ways, free of violence (Kaufman 1998).

A gendered approach to the issue of energy poverty thus needs to take into account the changing roles of both men and women, and energy policies need to be designed such that they enable both men and women to lead better lives.

It is therefore important to analyse the gender and poverty links as well as the gender and energy linkages. At a more practical level, it is becoming increasingly clear that the ways by which men and women become poor are different, as are their capacities to extricate themselves from poverty. Ending women's drudgery in the context of access to energy is more than simply reallocating economic resources; it involves redistributing power. Men will have to relinquish some of their economic, political and social power if women are to have their fair share of it (UNDP 2006). Some areas where these differences are clearly visible are detailed below:

Energy policies need to be designed such that they enable both men and women to lead better lives

- Men and women are positioned differently in relation to the 'productive' and 'reproductive' economies; this affects their assets and entitlements. A number of studies show that men and women view energy differently. Technology is rarely gender neutral and men and women have different relationships with it due to the sexual division of labour. The issue of access and control of technologies within households and communities is an important one and needs to be addressed specifically (Cecelski 2002).
- Conventionally, poverty has been measured by examining the income and basic needs dimensions. A more complete analysis should take into account how men and women experience poverty differently. To do this, a more extensive definition of poverty is required – one that includes social autonomy, power and agency as dimensions of poverty.
- Inheritance laws in many developing countries hinder asset accumulation for women. Even if women do inherit property, it is often the male members of the family who manage it, with men making decisions for the women.

- Women have specific needs for electricity in the pumping of water, agricultural processing, security, work productivity and health. Energy policies need to recognize these needs as well as other time and labour needs of women so that they can engage in income-generating activities. Women benefit more from certain community-based initiatives such as street lighting (improves security) and water purification (improves health) (Cecelski 2000).
- Poor women and girls spend a disproportionate amount of their time on unpaid household labour and farming tasks. This time is not accounted for in the national income statistics nor in calculations relating to energy needs and expenditures. This unpaid labour is often seen as 'free', but it is neither free nor cheap. It reduces the time that women have available for education or for income-generating activities.
- Women are good 'traditional energy managers' at the household level; poorer women have to manage with extremely frugal resources. It is now being recognized that women can play a vital role in popularizing new technologies that are non-polluting and sustainable. However, women have been excluded from energy policy debates and decision making, even though they are key stakeholders in the development process.

1.3 Gender and energy: recharging women's lives

Energy is needed for cooking, heating, lighting, for agricultural tasks like tilling, irrigation, harvesting, milling and processing, and for industrial activities. It is also required as an input for water supply, communications, health, education and transportation.

In the absence of modern energy services, women spend a large amount of their time on unpaid household and farm tasks

The energy needs of women, however, are quite different from those of men. In rural areas, for example, men use energy predominantly for agriculture, transportation and industries, while women need energy inputs for their household chores such as cooking, space heating, post-harvest processing and for small enterprises. In the absence of modern energy services, women spend a large amount of their time on unpaid household and farm tasks, leaving little time for much else. Addressing women's basic subsistence needs and releasing their time and labour through improved energy services is a necessary first step

towards poverty reduction. The role for energy services then is one of reducing drudgery, freeing time from domestic chores to provide flexibility to the working day of women, and enabling them to participate in productive activities. The availability of electricity can extend the working day, assist in the establishment of small home industries and improve productivity in agriculture (Clancy et al. 2003).

When energy has to be purchased, men enter the decision-making process, and often, energy is purchased first for recreational equipment (televisions and radios) and then for labour-saving equipment which can simplify domestic tasks (Clancy et al. 2003). Decisions on how/where electricity and electricity services are provided to households and communities also influence women's ability to take advantage of these services. For example, an evaluation of a rural electrification project in Tamil Nadu, India showed that men benefited more than women because the electricity provided was used to run irrigation pumps, which substituted for oxen-drawn water (Rengaswamy et al. 2001). This was a task performed by men; once simplified, the men gained free time and could engage in politics and in improving agricultural methods. The men thus bettered their social and human capital, while the needs of the women were not addressed at all.

If energy is provisioned for women, they too can experience similar gains in social and human capital. Energy can provide valuable benefits to women such as time savings and reduced household expenditure, increased school attendance by girls, and empowerment through having more choice in organizing their work and through access to television and media.

Energy can provide valuable benefits to women such as time savings and reduced household expenditure

Better energy access can also directly help women's income-earning activities. Women's micro-enterprises, which make an important contribution to the household income and in women's empowerment, are often heat-intensive (food processing); labour-intensive; and/or light-intensive (home-based industries with work in evenings). The absence of quality energy and other coordinated support for these activities (such as information and technical training, access to equipment, credit facilities and markets) affects women's ability to operate micro-enterprises profitably and safely (Cecelski 2000). Thus, the provision of affordable and regular energy supply is a key factor in the sustainability of these enterprises. While energy may have important effects on women in relation to the MDGs (see Table 1), this varies greatly according to the social and economic environment in which the women are placed.

Furthermore, savings in energy costs and improvements in energy efficiency can effectively increase household income and food consumption. For example, some studies estimate a reduction in household expenditures on energy of between 20 to 50 percent with more efficient and lower-cost cook stoves and lighting fuels. However, the amount of income generated from improved fuels and lighting and how much control women have in decisions on the use of such increased income is unclear.

Energy impacts maternal health and leads to reduced infant mortality and improved infant and child health

Ultimately, energy impacts maternal health and leads to reduced infant mortality and improved infant and child health, as well as contributing to a decline in deforestation and greenhouse gas emissions (ENERGIA December 2005). Thus, energy impacts a range of MDGs, such as the goal to achieve universal primary education, promote gender equity and the empowerment of women, reduce child mortality and improve maternal health, and ensure environmental sustainability (MDGs 2, 3, 4, 5 and 7).

Box 2: The 'telephone ladies' of Bangladesh – higher incomes and higher status

The Grameen Phone (Village Phone) Programme began from a social commitment that believes that "good development is good business". The programme facilitates women borrowers of Grameen Bank to access GSM mobile technology through the Village Phones (VP).

The VP serves as an owner-operated pay phone and the 'telephone ladies' become mobile public call offices. This allows the rural poor who cannot afford to become regular subscribers to avail of telecommunication services.

A loan from the Grameen Bank (usually about Taka 12,000) pays for a handset, the subscription and incidental expenses. The regular supply of electricity is a prerequisite for the success of Grameen Phones, since the phones require frequent recharging.

Initiated in 1997, the VP Programme has grown rapidly, and in May 2006, there were more than 200,000 VP subscribers. The VPs in operation now provide telecommunications access to more than 60 million people living in rural areas of Bangladesh.

In a country with the lowest phone density in South Asia, the Grameen Phone operators provide villagers with vital links to services such as hospitals, to relatives both at home and abroad, and to markets in the cities. The Village Phone programme provides broad benefits, including higher productivity, greater social welfare, new sources of rural income, and enhances the social status of women from poor rural households.

Sources: Adapted from information from Grameen Foundation and Grameen Phone

Table 1: Impact of energy on MDG 1

Contribution towards poverty reduction (MDG 1)	Possible gender and energy linkages
Saving time and effort	Reallocation of time saved in fuel wood collection and cooking to engage in income-generating activities, largely carried out by women. Energy can reduce drudgery of tasks such as agro-processing, grinding and milling, and increase opportunity for enterprise and income generation.
Using energy services for income generation	a) Modern energy sources can impact on women's agricultural tasks and productivity: Women are responsible for the high-drudgery, low-technical input tasks like weeding and planting in agriculture, which can be made easier through energy inputs. Mechanized agro-processing can increase food supply, with reduced effort. Biogas slurry can help improve agricultural productivity. b) Modern energy services can impact on income generation in non-agricultural activities: Women operate many informal sector enterprises, and these can benefit from improved energy services. More efficient fuel conversion technologies can reduce energy costs in industries. Lighting and thermal energy can enable rearing of piglets and chicks, which require controlled but warm temperatures through out the night. c) Lighting can extend working hours in the evenings. d) Women can work as entrepreneurs, delivering energy services.

Table 1: Impact of energy on MDG 1 (continued)

Contribution towards poverty reduction (MDG 1)	Possible gender and energy linkages
Direct saving in household energy expenditures	Reduction in share of household income spent on cooking, lighting and heating by introducing clean, efficient fuels. Reduction of health expenditure related to biomass use (indoor air pollution).
Contribution towards improvements in social capital and quality of life	Reduced time spent on household chores allows women to play greater roles in the public domain. Radio, television and other communication technology powered by energy improve access to the outside world. When freed from chores like fuel wood collection, girls (and boys, as the case may be), can attend school. Street lighting improves safety at night, especially for women. As modern lifestyles become more rushed, women need more cooking and energy options to aid their work. Availability of efficient equipment for cooking, heating, water supply and lighting. Availability of electricity allows women and girls safe movement in conflict/emergency situations.

Source: Dutta (2005)

1.4 Energy and empowerment: 'beyond the light bulb'

Different forms of energy can meet women's strategic needs and help to provide them with some control over their own time and lives

Women's enterprise development is often advocated as a means for women's empowerment.⁵ Increased access to non-polluting power for lighting, cooking, and other household and productive purposes can have dramatic effects on women's empowerment by improving access to education, nutrition, health and economic opportunities, and enable women to participate in community activities. These improvements in women's lives can, in turn, have significant beneficial consequences for their families and communities (UNDP 2004a).

Table 2 provides some examples of how different forms of energy can meet women's strategic needs and help to provide them with some

⁵ Empowerment is about power and changing power relations in favour of those who previously exercised little power over their own lives. Batliwala (1993) defines power as having two central aspects – control over resources (physical, human, intellectual, financial and the self), and control over ideology (beliefs, values and attitudes).

Table 2: Improving the position of women through energy: some possibilities

Energy Form ⁶	Women's needs		
	Practical	Productive	Strategic
Electricity	Pumping water: reducing need to haul and carry Mills for grinding Lighting improves working conditions at home	Increase possibility of activities during evening hours Provide refrigeration for food production and sale Power for specialized enterprises such as hairdressing and internet cafes	Make streets safer: allowing participation in other activities (e.g. evening classes and women's group meetings) Expand horizons through radio, TV and internet
Improved biomass (supply and conversion technology)	Improved health through better stoves Less time and effort in gathering and carrying firewood	More time for productive activities Lower cost of process heat for income-generating activities	Control of natural forests in community forestry management frameworks
Mechanical	Milling and grinding Transporting water and crops	Increases variety of enterprises	Transport: allowing access to commercial and social/political opportunities

Source: Clancy et al. (2003)

control over their own time and lives, and this in turn may contribute to women's empowerment.

Empowerment implies women have more autonomy and are better able to make decisions on issues that shape their lives, both at the household level and in society in general. This autonomy can be financial if women as individuals have means of making money and can spend it as they choose. But it can also mean more freedom. Empowerment of women might mean, for example, that educational and career opportunities are open to them, where these were formerly restricted.

Empowerment implies women have more autonomy and are better able to make decisions on issues that shape their lives

⁶ Practical needs are for household tasks; productive needs are for enterprises; strategic needs are for women's empowerment.

Energy is one of the many elements that contribute to the empowerment of women. It is not energy that has the potential to empower women, but the process by which the energy technology is introduced itself that often empowers women. Empowerment may also come as a result of having the technology (Clancy and Dutta 2005).

Box 3: Community-owned micro hydro system in the Western Solomon Islands: women make the difference

Bulelavata is a small, remote village in the Western Solomon Islands. The people here were used to a subsistence lifestyle, typical of men and women in thousands of other villages across the Pacific Islands. In 1998, the community began the process of establishing an energy-for-development project.

The community-owned micro hydro system (funded by the Australian International Greenhouse Partnerships, Caritas, and the Provincial Government) was officially opened in 2001. The system produces 24 kilowatts of power and a 1.5-kilometre high-voltage transmission line enables the community to sell power to the Provincial Secondary School.

For the women of Bulelavata, the energy project has had a profound impact; ranging from the practical, quantifiable advantages of lighting and increased community income to qualitative outcomes such as solidarity and empowerment. The project encompassed project policy support, specific women's awareness and training workshops, as well as community workshops, (in which women also participated).

The electricity project has made the women of Bulelavata more confident and outspoken and they now participate much more in community development activities.

Source: Adapted from Bryce, D. and C.C. Soo (2004)

It is not energy that has the potential to empower women, but the process by which the energy technology is introduced itself that often empowers women

There are a number of examples of women taking up energy technologies that have contributed to increasing their incomes. Enterprises that manufacture or sell energy equipment (such as cook stoves), produce energy for sale (as in the Multi-Functional Platforms of Mali described in Box 1), and provide telecommunication links through mobile phones (as in the Grameen Phones in Bangladesh discussed in Box 2), are all successfully owned and operated by women. In Bangladesh, women telephone operators said that the Grameen Phones provide them with a source of income, better status and self-esteem. Similarly, in the Western Solomon Islands, the management of a community-owned micro hydro system by women has meant benefits in terms of lighting, education, increased incomes and empowerment (Box 3).

1.5 Gainers yet losers

The expansion of energy programmes and energy services does not automatically ensure that men and women will benefit equally in terms of improved incomes, livelihood opportunities or even well-being.

A number of studies show that while time-saving from electricity does occur, it does not reduce the overall workload of women, although it does make their work easier. Fuel savings in one area of drudgery can result in increased drudgery in another area (Clancy et al. 2003). When time savings do take place because of the introduction of energy-saving devices, men are more likely to use these savings primarily for recreation and leisure, whereas women are more likely to redirect them to other household chores. In Sri Lanka, women surveyed said that lighting gives them about two extra hours of useful time, which is invested not only in better housework and care of the children, but also in time to rest, socialize and watch television, and sometimes to develop income-generating activities (Matly 2003).

In general, women have less access to productivity-enhancing resources, such as labour, collateral, credit facilities, information and training. These inequalities often restrict women's ability to benefit from available opportunities. Hence, it cannot be assumed *a priori* that energy interventions that benefit men will necessarily benefit women as well. Special enabling conditions may need to be created to ensure that women are able to access modern energy services and benefit from them equitably.

For example, in impoverished, post-conflict and conservative countries like Afghanistan, many 'energy-related constraints' that hinder women from participating in productive activities have their roots in income/poverty and cultural attitudes. In such situations, even if more efficient and cheaper energy services are made available to women, this may relieve them of the drudgery of their household chores, but it is not a given that the time so freed will be used for personal enrichment, education, skill development or even for income generation. Instead, it may be that the women take on additional tasks. It is therefore critical to delve more deeply into the dynamics of the conditions under which energy makes a difference (Dutta et al. 2005).

Special enabling conditions may need to be created to ensure that women are able to access modern energy services and benefit from them equitably

2

Gender, energy and poverty in the Asia-Pacific region



Gender, energy and poverty in the Asia-Pacific region

The argument for addressing gender inequality is not simply that it exists in all societies but that it exists at all levels of society. It makes the effects of poverty worse for women and biases the form taken by economic growth.

– Naila Kabeer (2003), *Gender Mainstreaming in Poverty Eradication and the Millennium Development Goals*

The number of people who lived on less than US\$1 a day in the Asia-Pacific region in 2003 was 621 million (ADB 2005a). Most of this poverty is concentrated in rural areas. Even though data on poverty is rarely gender segregated (Kelkar and Nathan 2005b), a high proportion of the poor are known to be women.

The primary sources of national poverty statistics are income and expenditure data collected through household surveys. This data is used as an indirect measure of access to opportunities and resources for household members. Reliance on such data is inadequate for capturing differences in poverty among women and men since it focuses on poverty estimates for households rather than on those for individuals (UN 2005). Conventional economics sees the household as organized around the pooling of income and meeting the welfare needs of all members. However, studies from different parts of the world suggest that, on the contrary, there are widespread and systematic inequalities within households. These may be related to age, life cycle status, birth order, relationship to household head and other factors. The most pervasive, however, are those related to gender. Attempts to estimate poverty that overlook inequalities in the household therefore provide a very incomplete picture (Kabeer 2003). In addition, poverty statistics based on income and expenditure data do not assign an economic value to unpaid domestic work or to care-giving activities that are most often performed by women.

Most countries in the Asia-Pacific region have a legal framework to support gender equality and women's empowerment, including provisions in the constitution and in the national laws. Yet, women are unable to benefit fully from existing legal provisions due to the

2

Even though data on poverty is rarely gender segregated, a high proportion of the poor are thought to be women

persistence of traditional practices, the lack of awareness of their legal rights and gaps in law enforcement. Customary practices throughout most of Asia and the Pacific Island Countries (PICs) prevent women from exercising the right to own and control land, which results in their exclusion from the process of rural and agricultural development. In both Asia and the Pacific, (except in a few countries) there is unequal representation of women at all levels in decision-making bodies, from the village or community level to the Parliamentary level. The status of women in most of the region is considerably lower than that of men (see Figures 1 and 2).

Customary practices throughout most of Asia and the Pacific Island Countries prevent women from exercising the right to own and control land

Some aspects of gender and poverty in the region are summarized below:

- Gender-related Development Index (GDI), an indicator for overall development of women, measures achievements in the same dimensions as the Human Development Index (HDI) and uses the same indicators, but captures inequalities in achievements between women and men. The region accounts for some of the lowest GDIs in the world. Except for Malaysia, the Philippines, China and Sri Lanka, all the study countries fall below the halfway mark among the 140 countries ranked for GDI (UNDP 2005a).
- The Gender Empowerment Measure (GEM), a measure of gender disparities that measures the extent of women's deprivation in income and decision-making power, is consistently low in the region. Except for Malaysia and the Philippines, all the countries ranked within the region fall in the bottom 20 percent of the 80 countries (worldwide) that have been ranked on GEM (UNDP 2005a).

The estimated earned income for women in the region is considerably lower than that for men, often less than half and sometimes even one-third that of men. In Malaysia, Nepal and Indonesia, for example, estimated earned income for women is about half that of men, while in Iran and Pakistan, it is about a third of the income for men. To a large extent, the reason for the low GDP per capita for women is under-reporting of women's role in the economic sector and their low social status. This is somewhat paradoxical given that when both household and 'productive labour' for the market are considered, women work considerably longer hours than men do. This gap is particularly pronounced in poor households. The time that women allocate to agriculture or land-based labour is three to four times greater than that

The time that women allocate to agriculture or land-based labour is three to four times greater than that of their male partners

of their male partners (Mencher 1993, quoted in Kelkar and Nathan 2005). The energy, poverty and gender (EnPoGen) study in Sri Lanka revealed that women get up earlier and are awake for 16 hours or more, of which (excluding food and rest time) they spend more than 13 hours working, to be compared with 10 hours of work for men (Masse and Samaranayake 2002).

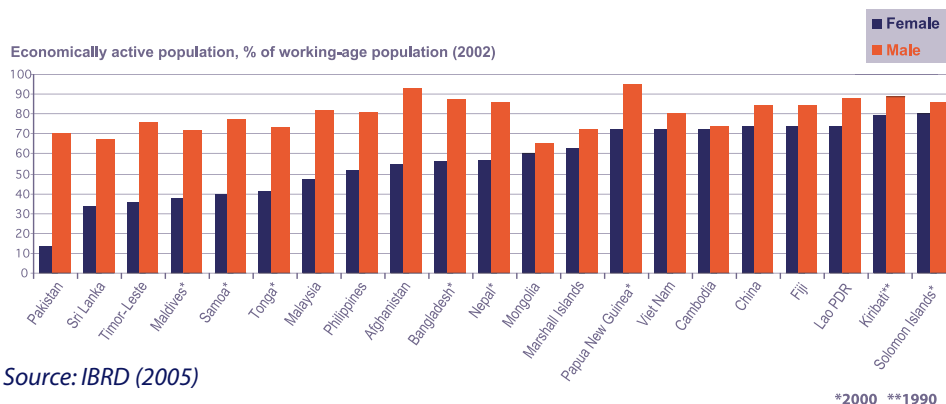
- Women's participation in the workforce in South and South-east Asia is largely restricted to the informal economy. There has not been any substantial movement of women into the formal workforce, i.e. those employed in registered, corporate units with the various benefits that workers expect to get, such as provident fund, medical insurance and paid leave.
- Women are concentrated in the lowest remunerated categories of self-employment and casual wage labour, and bear a far larger share of non-commercial (unpaid) subsistence work (food processing and gathering of food, fuel and water) than men, and that share is rising due to male migration (IFAD 2002).
- There is substantial variation in the percentage of women engaged in economic activities in both Asia and the Pacific region. In Pakistan, for example, the percentage of women who are economically active is 13.7 percent, while in Lao PDR it is 74 percent. In the Pacific, the proportion of economically active women ranges from 41 percent in Tonga to 80 percent in the Solomon Islands⁷ (see Figure 2).
- While the status of women in the PICs is traditionally regarded as being lower than that of men, there are many countries where the HDI for women is higher than that for men. These are: Tuvalu, Palau, Nauru, Tonga, Kiribati, Samoa, Cook Islands and Fiji. In Niue, the HDI for men and women was equal. The countries where HDI for women is lower than that for men are: Federated States of Micronesia, Marshall Islands, Vanuatu and the Solomon Islands, while in Papua New Guinea, it is substantially lower (UNDP 1999).

⁷ This data has been compiled from WDI database, www.worldbank.org.

Figure 1: Gender and development: GEM and GDI ranks*

*Only countries that have data available have been mapped.

Source: UNDP (2005)

Figure 2: Women's role in economic activity

Source: IBRD (2005)

2.1 Inadequate access to modern energy services

In an attempt to understand the impact of energy services on the lives of women in the region, these variables have been mapped as part of the gender review: access to electricity and the cooking energy mix. These two variables have been selected because cooking, heating and lighting together constitute the bulk of energy consumption (in rural areas,

Women are therefore impacted by the access to and supply of electricity, as well as factors that influence the availability and efficiency of different kinds of cooking fuels

cooking predominates). Women are therefore impacted by the access to and supply of electricity, as well as factors that influence the availability and efficiency of different kinds of cooking fuels. While transportation also has the potential to influence women's lives in a variety of ways, data limitations prevent any meaningful discussion of this variable.

Commonalities among the countries

A total of 30 Asian and Pacific countries⁸ have been mapped with regard to electrification and cooking fuels, as part of the Rapid Assessment and Gap Analysis exercise, which was one of the initial activities of UNDP's Regional Energy Programme for Poverty Reduction (REP-PoR). The 15 Asian countries vary considerably in terms of geographical locations, income per capita and social and cultural aspects. The 15 PICs also have wide disparities in resources, development levels and GDP per capita. Despite this, a number of commonalities emerge from a comparative analysis of the Asian national reports and the Pacific regional report, with reference to gender issues and access to energy services.

- Most of the discussion on gender issues in energy in the Country Reports is largely qualitative because neither poverty nor energy statistics are disaggregated by gender. This reflects the inadequate attention paid to gender and energy issues in the study countries.
- Most Country Reports emphasize the high dependence on biomass fuels for cooking and the resulting drudgery for women since they are usually responsible for fuel wood collection.

⁸ The countries in Asia include Afghanistan, Bangladesh, Cambodia, China, Iran, Lao PDR, Malaysia, Maldives, Mongolia, Nepal, Pakistan, Philippines, Sri Lanka, Timor-Leste, and Viet Nam. The PICs include Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea (PNG), Samoa, Solomon Islands, Tonga, Tokelau, Tuvalu and Vanuatu.

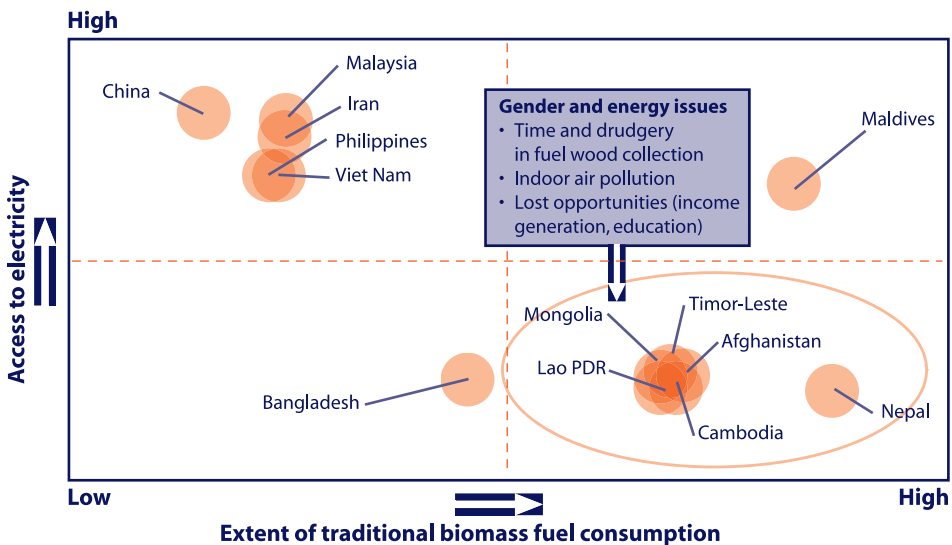
Table 3: Access to energy in Asia and the Pacific

Countries	Access to electricity	Cooking energy
China	There are 7 million people without access to electricity; this is because the villages are in remote locations and have low population densities.	Straw and fuel wood contribute to 54 percent of the energy requirements in rural households. At the end of 2002, 21.21 million rural households used electricity and 14.65 million households used biogas for cooking.
Malaysia, Iran, the Philippines, Mongolia	High level of electrification.	LPG is the dominant fuel used for cooking in Iran and Malaysia. Despite the fact that 60 percent of households in the Philippines have access to LPG, 80 percent of households continue to use fuel wood for cooking.
Maldives, Viet Nam, Sri Lanka, Pakistan	Low level of household electrification in rural areas, which rely on kerosene lamps for lighting, except in the Maldives.	Predominance of biomass use for cooking in rural areas. Traditionally, biomass is the major source of energy for cooking and heating in Viet Nam. In the Maldives, outer island households are dependent on biomass, including fuel wood, for cooking energy.
Lao PDR, Bangladesh, Timor-Leste, Cambodia, Nepal, Afghanistan	Very limited access to electricity in rural areas (both in terms of quality and quantity).	Extensive use of biomass as cooking fuel. Limited use of LPG in rural areas because of high price, lack of service and delivery difficulties in rural areas. High use of agricultural residues in Bangladesh. Inefficient cooking practices and the lack of alternative fuel products creates time pressures for women and children. Indoor air pollution is a serious problem.

Table 3: Access to energy in Asia and the Pacific (continued)

Countries	Access to electricity	Cooking energy
PICs	In the PICs, 70 percent of people are without access to electricity, but access varies from 10 percent to 100 percent among the islands. Within the PICs, electrification has had little impact on Melanesian households because it is either unavailable or unaffordable. On the other hand, Polynesian and Micronesian countries are on the road to full electrification. Even when electricity is provided by governments on highly subsidized terms, as in Fiji, the supply in the areas not covered by the Fiji Electricity Authority (FEA) is often intermittent, irregular or is only available for a few hours each day. In Nauru, Niue, Palau, Samoa, Tonga, Tokelau and Tuvalu, nearly all lighting is electric, except for kerosene during outages. Nearly all the rural lighting in Kiribati and much of Tonga is powered by solar energy. The use of kerosene for lighting is common in PICs with largely un-electrified rural areas. In PNG, nearly 30 percent of the rural households still use wood fires as the main source of lighting (in 1996/97).	Although the PICs are slowly shifting away from wood to kerosene and even LPG in more affluent communities, wood and other biomass is still the main cooking fuel. Even in the affluent Cook Islands, wood continues to be the main cooking fuel for 11 percent of households. Access to biomass for fuel is not a problem in most rural areas of the PICs, but access is becoming a problem in urbanized atolls and cities such as Port Moresby in PNG and Honiara in the Solomon Islands. Where fuel wood is purchased in urban markets, women may have more free time as they are not out gathering wood, but they also must spread their limited household budgets further to pay for the fuel, and it is the poorer urban households who are the main users of wood for cooking.

Source: UNDP (2005b)

Figure 3: Mapping gender and access to energy services in Asia

- Access to modern energy services is often considered synonymous with electrification. This is somewhat inconsistent with the prevalent energy needs in light of the following facts: (i) cooking accounts for the largest share of household energy consumption; (ii) biomass has been, and is likely to continue to be, the predominant fuel used for cooking; and (iii) the provisioning of electricity does not address rural cooking needs in most countries.

- Gender issues are examined within the confines of cooking energy. Electrification is usually regarded as being gender-neutral.

- There appears to be an implicit assumption that rural electrification leads to rural development; however, this linkage is neither demonstrated nor reflected in existing planning and monitoring and evaluation (M&E) approaches.

- In most countries, microfinance institutions (MFIs) play an important role in increasing access to credit in rural areas, particularly for income-generating activities. Countries like Malaysia, the

In most countries, microfinance institutions play an important role in increasing access to credit in rural areas, particularly for income-generating activities

Philippines and Nepal have funding windows specially targeted at women. Financing for energy is restricted to financing access costs of electrification and solar photovoltaic (SPV) systems in some cases.

Despite these commonalities, the countries vary significantly in levels of development, income, resources and cultural attitudes:

- Within the 15 countries in Asia covered by this report, the GNP per capita (in the year 2004) was \$250 in Nepal, \$350 in Cambodia, but as much as \$4,520 in Malaysia (WDI 2005).
- In China, even though a high proportion of the population has access to electricity, it is reported that there are about 7 million people spread over 30,000 villages without access to electricity. Since 96 percent of villages and 94 percent of households are said to be served by large or small electricity grid systems, there is a strong sense of exclusion for people without access. The impact of migration has been considerable in poor rural areas, where able-bodied men have moved to urban areas, leaving women to manage both productive and reproductive work (IDS 2003).
- The PICs are spread over an area of more 30 million square kilometres, (mostly ocean) and represent a sub-region that is highly diverse economically, politically and culturally. The populations vary in size from 1,500 people in Niue to about five million in PNG. Their combined population is approximately eight million people. The proportion of rural population also varies from zero in Nauru to 90 percent in the Solomon Islands. Per capita GDP varies from US\$700 in Kiribati to over US\$8,000 in Palau (UNDP 1999). Most of these countries rely on traditional fuels for their household energy needs.

Rural electrification continues to be the largest rural energy programme, both in terms of investment as well as coverage

2.2 Rural electrification: limited access, irregular supply

In all the countries in the region, rural electrification continues to be the largest rural energy programme, both in terms of investment as well as coverage.

The main issues in rural electrification are the limited expansion of the grid in most countries, especially to remote areas, erratic and unreliable power supply, which necessitates dependence on multiple fuels for lighting, and high prices (in many countries), which make electricity unaffordable for the very poor. These issues are particularly relevant in the case of the PICs. In some of the more remote islands in Fiji for instance,

supply is often intermittent and is available only for a few hours a day. This poses a serious problem for income-generating enterprises that depend on electricity as well as for households, which are dependent on electricity for lighting and have begun to use modern conveniences like refrigerators.

It is now well established that the benefits from rural electrification accrue more to the rich than to the poor. Studies show that rural electrification does not directly reduce poverty by helping the poorest rural people (IDS 2003).⁹ Most of the benefits from rural electrification go to wealthier people; once connected, the amount of electricity consumed and therefore the benefits obtained depend on the ability to buy electrical equipment, light fixtures, televisions, fans, water heaters, water pumps or motor-driven machines. Rural electrification reduces rural poverty only through a general rise in rural income obtained by productive use. With the exception of irrigation pumping, the productive uses of electricity appear to come about only when other factors are already raising rural and national per capita income (IDS 2003).

There is an implicit assumption that the benefits of electricity are gender neutral; however, this is a misplaced notion as women perceive the need for and use of electricity quite differently from men. For example, a study in Indonesia that assessed the impact of rural electrification on poverty and gender equity showed that among the benefits appreciated by women is no longer having to accompany small children at night because lighting allows them to get around without continuously bumping into things (Madon and Gardener 2002). Another highly appreciated benefit was that women no longer had to worry about fires from kerosene lamps. The same study in Sri Lanka revealed that the major benefit to women is the time they save through avoided journeys that they earlier had to make to take the batteries to be charged or to buy kerosene (Masse and Samaranayake 2002).

Women perceive the need for and use of electricity quite differently from men

There are some reservations regarding the impact of lighting on women's well-being. For instance, it is sometimes suggested that if electric light extends working hours into the evening, this adds to women's already long working day (Clancy 2000). Others hold that electricity helps women to perform a number of chores in light rather than in darkness. Unfortunately, there is insufficient empirical data on what use is actually made of lighting and how it affects women's lives.

One of the few detailed studies with gender-disaggregated data on rural electrification reported that women in rural Bangladesh felt that while

⁹ Summary of the 1995 World Bank Operations Evaluations Department Report.

electricity had not brought a real reduction in their workload, it had given them greater flexibility (through lighting) in the organization of their work patterns (Barkat et al. 2002).

In Housanxi, a recently electrified village in Hubei province in China, women thought that the biggest positive change after electrification was a reduction in time spent looking after pigs, with mechanization of pig fodder cutting and corn grinding (IDS 2003). Women's resting time also increased substantially. However, this was partly offset by an increase in the time spent working in the fields. This was in part because the time saved from pig-feeding tasks was used for household agricultural work and partly because some men migrated, leaving their agricultural work to women.

2.3 Urban electrification: so near yet so far

The provisioning of energy for the poor in urban regions is an area that receives scant attention. In contrast to poor rural residents, the urban poor live next door to modern energy services. However, they can seldom if ever afford electricity, even though most urban areas have access to electricity.

In practice, access to electricity by the urban poor is often complex and not always cheap or legal. In many poor urban areas, women-headed households which are often more numerous, are unable to access water or electricity services because the billing systems require formal employment references or a billing address. Poor women seldom own immovable property and their houses are usually not in their names. They tend to be more active in the informal sector and very few have permanent employment. Therefore, they find it extremely difficult to access electricity. Thus, ensuring that women have equal tenure rights to land and other assets is critical to developing equitable access to energy services.

Bureaucratic barriers (such as the need for a registered address) can be circumnavigated by the use of informal services, which can also be cheaper than the official providers. However, relying on these informal services can be dangerous, since it often means that connections and electric wiring are installed by untrained people (Cecelski 2005).

Ensuring that women have equal tenure rights to land and other assets is critical to developing equitable access to energy services

Box 4: Female-headed households in Ahmedabad slum get electricity

A successful networking initiative between the Ahmedabad Municipal Corporation (AMC), two NGOs – SAATH and the Mahila Housing SEWA Trust – and the Ahmedabad Electricity Company (AEC) has been able to provide legal electricity connections to the residents of the Parivartan Slum in Ahmedabad, India. The Municipality provided tenement security to the residents, NGOs provided loans for one-time connections, and the AEC provided legal electricity connections to 800 households.

Source: Extracted from Ahmedabad Team (2005)

Before this networking project, average losses to the AEC were 27 percent, and these reduced to 4 percent after legalization. The average daily consumption of electricity increased by 200 percent. With the support of the community, the connections were issued in the names of the women, thereby ending the discrimination between female- and male-headed households.

The extension of access to electricity is comparatively easier and less capital intensive in urban and semi-urban areas, but ensuring supply is an issue both in rural and urban areas. While there are genuine business obstacles to serving the poor (including poor urban women), such as low energy purchases and unpaid bills, it is still possible to devise innovative programmes. One suggested method would be for regulators to allow energy companies to charge different rates from urban consumers, subsidizing the urban poor and charging higher rates for affluent, high-volume customers to make up the lost revenue (Saghir 2006). It has been suggested that the initial cost of connection, installing meters, etc. be recovered by cross-subsidization over a longer period. Bill collection alternatives such as charge cards and community billing are also alternatives that can be used effectively to extend electricity provisioning to poor women (See Box 4 for a successful initiative from India).

In some countries, even though people have access to electricity in urban areas, they continue to rely on wood and charcoal, especially where energy prices are relatively high. Often, kerosene is used for lighting. The high cost of wood in urban areas (where wood is sold) and increasing prices of fossil fuels mean that increasingly higher proportions of income and household budgets are expended on energy. Even where electricity is available, it is often not used (for example, in some of the PICs) partly due to the high capital cost (wiring, installing the meters, buying bulbs and other equipment), the high price of electricity and often unreliable supply. In many cities in Asia and in some of the PICs, irregular supply is a major issue. In many developing countries, load shedding is a common

The increasing price of fossil fuels means that increasingly higher proportions of income and household budgets are expended on energy

strategy adopted to meet the problem of insufficient supply in relation to rising demand (Wamukonya 2002). People thus have to use multiple fuels to meet their energy needs and women are required to prepare for any supply problems that might occur.

In many countries, power sector reforms have been initiated, resulting in restructuring, commercialization and privatization of the energy sector. The role of the public sector in electricity provisioning is likely to diminish in the future, except as a regulator and facilitator. Liberalization of the petroleum markets in most countries of the region means that governments have less control over pricing and supply in the petroleum sector and, consequently, on the provisioning of services.

These developments pose a challenge for energy provisioning in Asia and the Pacific. It is not yet clear whether or not this will lead to greater efficiency and increased access to electricity for the poor and how it will impact poor women.

2.4 Cooking fuel: smoky kitchens and ill health

Even though electricity offers many benefits, it does not help address the major energy issue that women in rural areas face: access to a clean, affordable and safe fuel for their daily cooking requirements. More than half the population in developing countries still rely on traditional biomass fuels for cooking and heating and are subject to all the health risks posed by their combustion. In rural areas, cooking is the most important energy need in terms of women's time and effort. The collection of fuel wood is primarily the responsibility of women in almost all the countries, and the energy and physical cost of collection and the associated health and environmental costs are seldom considered by the household or taken into account at the policy-making level.

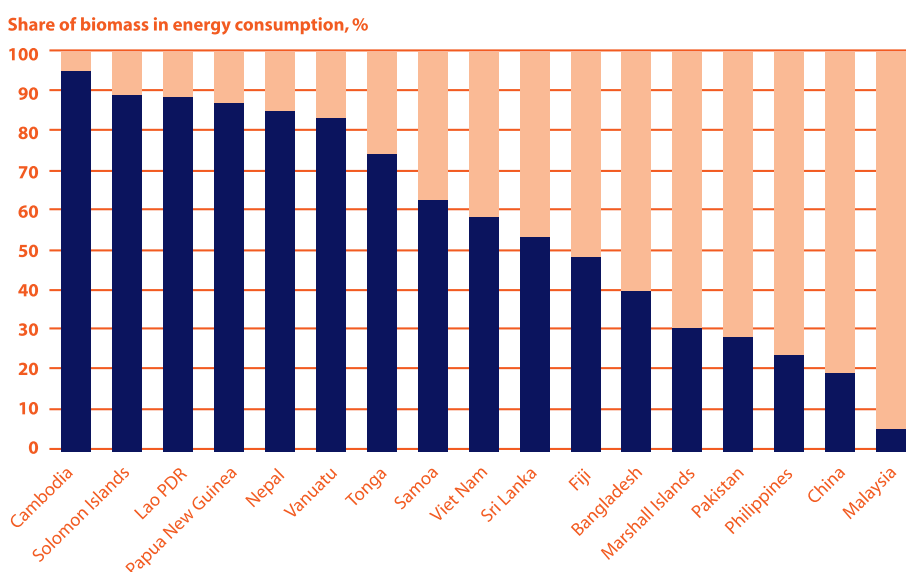
In all the study countries, there is a dichotomy between the prevalent energy needs for cooking and the focus of energy policies, which are heavily tilted towards electricity. Biomass continues to be the main source of cooking energy in most countries, except for Iran, where LPG is the dominant cooking fuel and is available to most rural families (see Figure 4). In the Philippines, cooking and water heating account for 90 percent of household energy use; fuel wood provides 75 percent of the total energy used in rural areas and more than 25 percent in urban areas (Polistico 2002).

More than half the population in developing countries still rely on traditional biomass fuels for cooking and heating and are subject to all the health risks posed by their combustion

Many women and girls suffer from health problems related to gathering and using traditional fuels. In addition to the time and physical burdens involved in gathering fuel, women suffer serious long-term physical damage from strenuous work without sufficient recuperation time. They are also exposed to a variety of health hazards from cooking over poorly ventilated indoor fires, including respiratory infections, cancers, and eye diseases. Globally, indoor air pollution accounts for 1.6 million premature deaths per year (WHO 2005). Exposure to indoor air pollutants enhances the risk of a range of respiratory illnesses, including lower respiratory infections in children and pulmonary disease, especially in women (See Box 5).

Many women and girls suffer from health problems related to gathering and using traditional fuels

Figure 4: Share of biomass in energy consumption



Source: IEA (2005) and UNDP/SPREP/GEF (2005)

* Lao PDR 1997; Fiji 1996; Marshall Islands 1999; PNG 1996/1997; Samoa 2001; Solomon Islands 1999; Tonga 1996; and Vanuatu 1999.

Women typically spend between two to five hours a day in the collection of fuel wood in most countries of the region

Women typically spend between two to five hours a day in the collection of fuel wood in most countries of the region. For instance in Lao PDR, where 97 percent of the households use wood or charcoal for cooking, a woman who collects wood for a family of five to six people must carry 120 to 150 wood loads per year, (each load weighing 15 to 20 kg). This takes up one to three hours of walking and cutting time every day. Families with little extra income invest in handcarts, which eases the work for women. Men and boys are involved in water and fuel collection when there is a handcart available (Lao Women's Union 2001).

There is some evidence that in situations where there is a monetary opportunity cost for women's time, the adoption of energy-saving devices is relatively easier and that the willingness for men to adjust to women's time schedules is higher (Nathan 1997). Women who have regular income-generating work in Lao PDR, for instance, have started thinking of conserving firewood in order to save labour and time by using charcoal and sawdust stoves, which have started appearing in the local markets. In houses where women undertake income-generating activities, families carry out planned wood collection and stockpiling so that they can cut and transport large quantities of wood at one time using carts or rented cars. For example, in Viengsay village, where women contribute significantly to family incomes through embroidery and weaving, the division of labour in the family has changed and the whole family is involved in fuel wood collection. The husband of the fastest weaver in the village has taken over all the household jobs (Kelkar and Nathan, quoted in Dutta 2005).

The type of fuel used increases in cleanliness, convenience, efficiency and cost as people move up the energy ladder. Animal dung is lowest on this ladder, and the fuel progresses in ascending order to crop residues, wood, charcoal, kerosene, gas and finally, to electricity. In most countries covered by this study, within biomass, the primary fuel used is wood, with the exception of Bangladesh, where agricultural residues are the predominant fuel (61 percent). In China, too, crop residues account for 54 percent of the biomass used for energy. Countries like Lao PDR, Maldives, Sri Lanka and Cambodia rely almost entirely on wood as a source of biomass. In Nepal, also, the dependence on fuel wood is high. In addition, in Cambodia and Lao PDR, the reliance on biomass for fuel needs is extremely high. In Pakistan, the share of animal dung in total biomass energy is as much as 19 percent.¹⁰

¹⁰ Data compiled in IEA (2005)

Box 5: Indoor air pollution: smoke kills

Cooking and heating with solid fuels such as wood, animal dung and agricultural waste, on open fires or stoves without chimneys leads to indoor air pollution. This indoor smoke contains a range of health-damaging pollutants, including small soot or dust particles that are able to penetrate deep into the lungs. In poorly ventilated dwellings, indoor smoke can exceed acceptable levels for small particles in outdoor air 100-fold. Exposure is particularly high among women and children, who spend the most time near the domestic hearth.

The World Health Organization (WHO) has assessed the contribution of a range of risk factors to the burden of disease and revealed indoor air pollution as the 8th most important risk factor, responsible for 2.7 percent of the global burden of disease. Globally, indoor air pollution from solid fuel use is responsible for 1.6 million deaths due to pneumonia, chronic respiratory disease and lung cancer, with the overall disease burden exceeding the burden from outdoor air pollution five-fold.

In high-mortality developing countries, indoor smoke is responsible for an estimated 3.7 percent of the overall disease burden, making it the most lethal killer after malnutrition, unsafe sex and lack

of safe water and sanitation. There is consistent evidence that exposure to indoor air pollution increases the risk of pneumonia among children under five years and chronic respiratory disease and lung cancer (in relation to coal use) among adults over 30 years old.

While more than two-thirds of indoor smoke deaths from acute lower respiratory infections in children occur in Africa and South-East Asia, over 50 percent of the deaths due to indoor air pollution occur in the Western Pacific region.

In most societies, women are in charge of cooking and they spend between three and seven hours per day near the stove preparing food. Fifty-nine percent of all indoor air pollution-attributable deaths are of females. Young children are often carried on their mother's back or kept close to the warm hearth. Consequently, infants spend many hours breathing indoor smoke during their first year of life, when their developing airways make them particularly vulnerable to hazardous pollutants. As a result, 56 percent of all indoor air pollution-attributable deaths occur in children under five years of age.

Source: Compiled and extracted from WHO (2005)

The impact of indoor air pollution on health has been well documented, but there are other costs as well. Studies by WHO show that women often carry loads of between 25 to 30 kgs and sometimes up to 50 kgs. This leads to postural defects and puts pressure on the spine, as women need to slant their bodies in the opposite direction to counterbalance the load on their heads (WHO 2000). Furthermore, deforestation means that women have to traverse longer distances for fuel wood and water.

The impact of indoor air pollution on health has been well documented, but there are other costs as well

In China (Yunan) and in other parts of Asia, women's and men's participation as well as status in the labour force is linked to the adoption of new fuels and appliances. The low opportunity cost of women's labour in rural areas limits the adoption of improved stoves, while women's entry into income-earning activities appears to promote a fuel transition. While the severely negative health impacts of biomass fuels make public subsidy of alternatives desirable, this will not necessarily result in fuel switching by households so long as the value of women's labour remains low (Kelkar and Nathan 2005).

Thus, in the foreseeable future, the probability of eliminating the dependence on traditional energy sources (especially fuel wood) in rural areas is negligible. In some areas, this dependence may decline somewhat, with the supply of conventional commercial energy and/or decentralized alternatives like biogas, solar power and other non-conventional energies, but biomass will continue to be the fuel of 'first choice' in most of Asia and the Pacific.

Improving efficiency and reducing health risks: the improved cook stoves programme

The high dependence on biomass and the price that women pay (in terms of time and drudgery and ill health) make it imperative that energy policy in Asia and the Pacific focus on improving efficiency and reducing health risks in the kitchen.

Relatively simple, inexpensive stoves can reduce the fuel needed for cooking by as much as 30 percent

Developing effective programmes for disseminating improved stoves is one way to reduce the health risks caused by indoor air pollution, which are faced largely by women and children. Relatively simple, inexpensive stoves can reduce the fuel needed for cooking by as much as 30 percent. Fuel-efficient stoves can reduce the aggregate demand for wood, easing pressure on the surrounding land and conserving poor households' scarce cash. Other benefits are the time saved in fuel wood collection and cooking, reduction in drudgery and a reduction in indoor air pollution, leading to better health.

The most successful cook stove programme has been in China, where after 20 years of popularizing the technology, there were 185 million ICS-user households in 1998 (out of a national total of 236 million rural households).¹¹ China focused efforts on regions where there were biomass fuel shortages or where such fuels were commercially available,

¹¹ Data compiled by the Ministry of Agriculture, China.

and subsidies were provided for supporting services rather than for the cook stoves themselves. The programmes ensured significant interaction between cook stove designers and users and relied on mass-produced cook stove components to reduce costs.

Box 6: Commercialization of efficient charcoal stoves in Cambodia

About 95 percent of Cambodians cook with biomass fuels. Cambodia's great natural biodiversity is threatened by uncontrolled wood consumption. While much of this demand is for timber, a significant amount is turned into charcoal, which is the preferred cooking fuel in cities, used by 40 percent of the population in the capital, Phnom Penh. The area of forests is diminishing but the price of charcoal has hardly increased over the last ten years, reflecting a thriving trade, lack of taxes and other constraining factors.

One way of reducing the unsustainable wood consumption is by reducing the demand for charcoal. The Cambodian Fuelwood Saving Project (CFSP) has developed a cheap charcoal stove, the New Lao Stove, which uses 22 percent less charcoal than the traditional 'Lao' stoves, which are traditionally used in

Cambodia. (The word 'Lao' is derived from the Chinese term 'Ang Lao' which means 'portable cooking stove made of clay').

CFSP has worked with stove users and producers to develop a stove that is more efficient and durable than the conventional bucket-type stoves because of better insulation, controlled air flow and a durable outer bucket. Over 130,000 New Lao Stoves have been produced and sold by 14 entrepreneurs over the past three years.

Although a New Lao Stove costs about three times as much as a traditional stove, users are willing to pay for one because they recover the difference in the price within two months through savings on the purchase of charcoal. A network of distributors and retailers has been established and a trade organization set up that oversees pricing and quality.

Source: Compiled from Ashden Awards for Sustainable Energy, UK and CFSP, Cambodia

The key lessons from the China experience are: (a) governments should promote private-sector initiatives to develop and market improved stoves in rural areas; and (b) programmes must be carefully targeted to those who will benefit the most (Saghir 2006).

The energy sector can play a significant role in reducing environmental damage and other harmful effects by introducing renewable energy sources, supplying modern cooking fuels at affordable prices, substituting cleaner fuels for dirty ones and increasing energy efficiency. Much of the presently used bioenergy originates from various types of agricultural and forestry residues, however, increasingly, different kinds of energy crops (such as sugarcane, sugar beet and maize) and plantations are

The energy sector can play a significant role in reducing environmental damage and other harmful effects

expected to provide the bulk of biomass for energy production. This is an area of particular relevance to PICs and will have a significant impact on women's energy requirements in the future.

Box 7: Biogas Sector Partnership in Nepal: small scale can be big

About 80 percent of the 4.2 million households in Nepal use fuel wood, cattle-dung cakes and agricultural residues for cooking, and kerosene for lighting. Demand for fuel wood substantially exceeds the rate of regrowth, and this is leading to degradation of the land and damage to vital watersheds.

The Biogas Sector Partnership (BSP) in Nepal installed over 124,000 domestic biogas plants in Nepal between 1992 and 2005. The plants use cattle manure to provide biogas for cooking and lighting. In addition, about 75 percent of the plants incorporate toilets. The biogas plants replace nearly all the use of fuel wood and make cooking easier, cleaner and safer.

In 20 percent of households, biogas provides safer lighting as well. This saving of unsustainable fuel wood use also reduces carbon dioxide emissions. The provision of toilets improves sanitation, and the effluent from the biogas plant is valuable organic compost.

The use of cattle dung to generate biogas is well known in the Indian subcontinent, but in no other place has it been used with such success as in Nepal. Biogas already

serves about one million people (four percent of the population of Nepal), and the biogas sector provides about 11,000 permanent jobs in the country.

A major benefit from the programme is the reduction in the consumption of fuel wood. BSP estimates that the average rural household of seven people uses about three tonnes of fuel wood per year for cooking (1.2 kg/day per person), so the plants installed to date save the use of about 375,000 tonnes of firewood per year. There is visible evidence of forest regrowth in Nepal, brought about mainly by an active programme of tree planting, and also by the reduction of unsustainable use through the biogas programme.

Fuel wood collection takes considerably more time than collecting and mixing dung. Research commissioned by BSP found that households with biogas plants save an average of three hours per day. This time savings has a huge impact on the lives of women and girls – women use the extra time for income generation, such as weaving, farm work and education.

Source: Compiled from Ashden Awards for Sustainable Energy, UK

2.5 Renewable energy technology: limited experience with gender issues

In most Asia-Pacific countries, women's energy needs have been addressed primarily through special programmes like the introduction of more efficient and less smoky stoves, biogas plants and solar cookers. In some countries, forestry interventions have tried to involve women in community programmes to grow more trees in an attempt to improve the supply of firewood in the future.

While many countries in the Asia-Pacific region do have technology programmes directed at improving energy services for women, most programmes have not moved beyond the pilot stage. Even in the case of renewable energy technologies (RET) like biogas and ICS, both of which have demonstrated gender benefits that are well documented, the country programmes have failed to make a significant impact (barring exceptions such as China). The Cambodia Fuelwood Saving Project (CFSP), a large cook stoves project that focuses on the commercialization of fuel-efficient stoves for homes and small-scale industries, occupies a small 10 percent share in the Cambodian cook stoves market. The encouraging feature is that even though the programmes cover only a small proportion of the population, they are expanding rapidly, benefiting people and impacting positively on the environment (see Box 6).

Women's energy needs have been addressed primarily through the introduction of more efficient and less smoky stoves, biogas plants and solar cookers

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Box 8: Empowering rural women: lessons from REDP

The Rural Energy Development Programme (REDP) of Nepal, initiated in 1996, aims to enhance rural livelihoods through the installation of micro hydro-power systems. Expansion of sustainable rural energy systems is seen as an entry point for economic development and poverty alleviation.

The Programme stresses community mobilization, bottom-up participatory planning and decentralized decision-making. Productive income-generating activities are targeted as the intended end uses of the energy supplied, and skill training is provided to promote agricultural and home-based businesses. The project ensures equity and empowerment of both women and men from every target household through the

establishment of separate women's and men's community organizations, which form the basic functional unit of the programme.

The equal opportunities offered have had a visible and positive impact in mobilizing women and integrating them into mainstream activities. The women in community organizations have a distinct voice in local affairs, and their capability for independent and collective action has increased. Two of five micro hydro schemes in a remote district in western Nepal (an area where women have traditionally had extremely low social status) are chaired by women. The project has meant reduced drudgery in household tasks and an increase in productive and community roles.

Source: Rana-Deuba, A. (2001)

The gender impacts of energy interventions are typically neither recognized nor monitored

The success in the region of the RET programmes has been limited. The Biogas Support Programme in Nepal, one of the more successful biogas programmes in the region, covers about four percent of the households at the national level so far (see Box 7). The region offers some experience on gender-energy-poverty linkages through innovative projects like the Rural Energy Development Programme (REDP) Nepal (see Box 8), the women's cooperatives in Char Montaz, Bangladesh (see Box 9), and the micro hydel projects of Chitral (see Box 10), all of which have been successful in terms of meeting the needs of women and empowering them. These projects are, however, few and far between, and the gender impacts of energy interventions such as grid-based electricity, SPV and micro hydro are typically neither recognized nor monitored.

Box 9: Women's micro-enterprise in Bangladesh: cooperation pays

Prokaushali Sangsad Limited (PSL) promotes rural women's micro-enterprise in Bangladesh. The project is located at Char Montaz, an island in southern Bangladesh, a five-hour motorboat journey from the nearest commercial centre. Electric grid extension to this area will not be economically viable even in the next 20 years, and therefore there is a high demand for alternative modern lighting.

Through a micro-enterprise, rural women are engaged in the construction and sale of fluorescent lamps that use direct current (DC) and rechargeable batteries. The women involved in the project run the manufacturing plant that produces the lamps and are certified by the local government to run their business as a cooperative. Besides lamp construction, women are also learning about quality control, business development and

marketing. If a woman constructs and sells two lamps a day, her daily income increases by 100 Taka (approximately US\$2). This is equivalent to the daily wages of a skilled labourer, and raises both her income and her social status.

The project advertised the lamps by organizing public meetings, distributing handbills, setting up billboards and posters and demonstrating at several locations. A detailed marketing plan was developed by the women, covering factors such as business location, customer characteristics, markets, competition, electricity demand, marketing goals and strategies and budget considerations. Today, more than 1,000 rural households are using these lamps in the remote islands of Bangladesh.

Source: Khan (2001)

The REDP, Nepal and the Aga Khan Rural Support Programme are among the few integrated energy projects that have systematically looked at gender concerns within the programme framework and have put in place effective mechanisms to enable women to participate meaningfully and benefit from the programme.

Even in the PICs, where there is substantial potential for the development of renewable energy sources, the share of renewable energy in total energy supply remains small. This may be due to a lack of information and an absence of local technical and institutional capacity in renewable energy technologies, and most significantly, inadequate financing and investment opportunities for their development. The production of cleaner alternative energy sources, such as biofuel from sugarcane, coconuts or other biomass products, is currently being researched and pursued (ENERGIA, 2006). The use of such resources will assist in reducing land degradation, as they can be planted on degraded or unused land (particularly the high-yielding varieties of short rotation species) or restored coconut groves. Over the long-run, such initiatives have the potential to impact women's lives by providing opportunities for employment and access to cleaner fuels.

Even in the PICs, the share of renewable energy in total energy supply remains small

Box 10: Microhydel programmes in Chitral improve lives and businesses

The Aga Khan Rural Support Programme (AKRSP) has been implementing a large number of microhydel programmes in the remote, hilly villages of Pakistan. The project communities are scattered and isolated and far removed from conventional electricity supplies. They have traditionally used smoky and unreliable pinewood torches and more recently, costly kerosene lamps for lighting. In the northern province of Chitral, AKRSP has established 172 microhydel power units, benefiting more than 20,000 households.

The projects are implemented, maintained and managed by village management committees

in which women play an active role. The villagers have been linked to various AKDN (Aga Khan Development Network) programmes and government institutions, which has enabled many of them to start small businesses.

The programme has a strong emphasis on women's capacity building. Availability of hydel power has improved women's economic productivity in many ways, directly by increasing incomes and by improving the quality of life and reducing the drudgery of labour-intensive tasks.

Source: Adapted from: Aga Khan Rural Support Programme, Regional Programme, Shahi Qila District, Chitral

2.6 Credit and microfinance to meet energy needs

The availability of credit and finance is critical to enabling women's participation in using improved energy supplies. The promotion of energy systems for income-generating purposes, and the adaptation of a credit scheme to reduce the down-payment requirements and extend the payment periods could expand the market for the systems, bringing down costs and making them more accessible to women and less-affluent borrowers. Bangladesh's Grameen Bank is the most well-known of all the micro-credit programmes that target women. Realizing the critical role of financing for energy provisioning, Grameen Bank has set up a special non-profit affiliate, Grameen Shakti, to act as a supplier of energy technologies – primarily solar home systems. Unlike the Grameen Bank, the Grameen Shakti finance programme is not specifically targeted towards women, and the customers are generally the wealthier members of the community (See Box 11).

In order to make credit programmes accessible to women, it is important to design programmes that cater to their needs

In order to make credit programmes accessible to women, it is important to design programmes that cater to their needs and the amounts that are borrowed kept small, with frequent and flexible repayment schedules. Low transaction costs in time and money, easy procedures for application, and the use of informal channels that are easily accessible to women are other factors that make microfinance work (Clancy and Dutta 2005).

Another example of best practice in interventions for financing energy and income-generating projects in rural and urban areas is the UNDP-funded ENSIGN project implemented in eight countries in Asia. Micro-credit banks and institutions were used as the channel for funds to reach micro-entrepreneurs. The vast majority of borrowers were women, although the project approach was gender neutral. However, women were generally found to be more enterprising, innovative, and creditworthy. Significant benefits for women, in addition to income impacts, were time savings and enhanced self-confidence from women's improved capabilities to contribute to household income and greater control over self-generated finances. In terms of what forms of energy these micro-enterprises require, it is interesting to note that in both rural and urban contexts, process heat and motive power were more crucial to income generation than lighting (UNDP 2004a).

Box 11: Grameen Shakti: microfinance provides solar home systems for rural households

Nearly 70 percent of households in Bangladesh are not connected to the electricity grid and depend on kerosene for lighting. This includes most rural areas and extends as far as the fringes of Dhaka. Grameen Shakti was established in 1996 to promote, develop and supply renewable energy technologies to rural households in Bangladesh. It seeks to improve the livelihoods of people who cannot access grid electricity.

Providing energy: Grameen Shakti has sold and installed over 65,000 solar home-systems (SHS) in rural Bangladesh, and brought major benefits to its users. By selling SHS, Grameen Shakti has provided lighting, communications (especially mobile phone charging) and TV, and increased employment opportunities. It is the largest single installer of SHS in Bangladesh.

The technology: SHS are small, stand-alone electrical systems. They consist of a photovoltaic (PV) module, which generates electricity from sunlight; a rechargeable battery, which stores electricity so that it can be used during both day and night; a charge controller, which prevents the battery from being over-charged or deep-discharged; four to six fluorescent lamps; and wiring and fixtures.

Microfinance: This is realized by providing microfinance with support from Infrastructure Development Company Limited (IDCOL) and the World Bank. This generates a cash pool which is 'recycled' to make further loans. Users pay an initial deposit followed by monthly installments lasting two to three years. The cost of a 50 WP system is about Taka 24,000, which is equivalent to about half the average annual income of a rural household. The customer pays a deposit of between 15 to 25 percent and the rest of the amount is given as a loan after signing a contract. Contracts are signed by either men or women. Grameen Shakti seeks to sign women where possible, since they are in the home more than men and therefore use the SHS more.

Training women: Grameen Shakti has started a network of technology centres throughout the country to manage the installation and maintenance of SHS locally. It emphasizes the importance of technicians who know local customs working through local branches and has trained 2,000 (mainly female) technicians. It aims to install 100,000 systems by 2006 and 1,000,000 systems by 2015.

Source: Adapted from Grameen Shakti and Ashden Awards for Sustainable Development, UK

3

Missing links:
policies, plans and
constraints to
enterprise



Missing links: policies, plans and constraints to enterprise

Policies and programmes suffer from a lack of incorporation of gender concerns

Poverty is 'gendered' because women and men experience poverty differently – and unequally – and become poor through different, though related, processes.

– Naila Kabeer (2003), from *Gender mainstreaming in poverty eradication and MDGs: A handbook for policy makers*

3.1 Inadequate attention to gender in national energy policies and institutional framework

While the governments in the Asia-Pacific region recognize the need for gender equality and increasing women's representation and are committed to gender equity, this commitment does not translate into action. Policies and programmes suffer from a lack of incorporation of gender concerns. If gender is considered at all, it remains a separate component or an addendum, without any link to main policy and programmes.

Energy policy in most countries tends to concentrate on commercial energy carriers: electricity, coal, gas and petroleum products. These do not touch the lives of the rural poor or women in any significant way. Investments tend to be directed to electricity and fossil fuels. The recognition of the problems that people face at the grassroots level is almost entirely absent; therefore, the problem is not addressed in energy policies. The energy-poverty links are seldom addressed and gender concerns are completely sidelined. Thus, there is an urgent need to bring the issues that concern women to centre stage. Energy policies require gender mainstreaming, a recognition of the impact of energy on women, an articulation of the issues that affect them and, in response to this understanding, the designing of appropriate policies and interventions.

3.2 Limitations of existing planning, monitoring and evaluation frameworks to reflect gender concerns

In energy programmes, monitoring and evaluation (M&E) typically measures quantifiable information, such as the number of new-grid electricity connections, number of villages covered or number of renewable energy systems installed. They are not designed to measure

socio-economic and gendered impacts; because of this, they are unable to reflect gender-specific consumer choices and perceptions.

The reasons for this lack of information and understanding are twofold. First, in most countries, the current M&E procedures are concentrated at the central level, while gender- and poverty-related processes and impacts are best monitored at decentralized levels. The role of decentralized local institutions in M&E is typically restricted to data collection, completing assessment forms and questionnaires, and sending them upwards for consolidation and reporting. At the same time, existing energy institutions do not have sufficient capacities, including knowledge of modern tools and approaches, to develop and implement M&E systems that are gender and poverty sensitive. The Country Gap Assessments completed by UNDP's REP-PoR show there is little or no gender training, nor the use of gender analysis for planning, implementation and M&E in the mainstream energy sector.

Gender-sensitive project planning and M&E emerged as a common capacity-building need in all the Gap Assessment Country Reports.

3.3 Constraints in promoting energy entrepreneurship among women

Within the Asia-Pacific region, women operate a large number of micro and small-scale enterprises, particularly in the informal sector. These enterprises tend to be concentrated around a narrow range of activities, such as food-processing industries and service-sector activities, with relatively low rates of return as compared to men's activities. This is in part because women tend to work in unskilled manual work and are often not registered, while men work in skilled manual work or management. Women often run income-generating activities from home since it enables them to combine productive tasks with reproductive tasks, such as childcare. Women's micro-enterprises are also often heat-intensive (food processing), labour-intensive, and/or light-intensive (home-based cottage industries with work in evenings). As a result, lack of adequate energy supplies for these activities affects women's ability to operate these micro-enterprises profitably and safely (Clancy 2000).

Women often run income-generating activities from home since it enables them to combine productive tasks with reproductive tasks, such as childcare

Some important challenges in providing energy services to women's enterprises are:

- Informal and unorganized nature of enterprises: Women-headed enterprises are often located in the home, and these cottage industries tend to be overlooked by agencies because they can be indistinguishable from other household activities.

Women's enterprises are affected more because of the additional barriers they face in optimizing available opportunities

- Heavy reliance on process heat: The majority of enterprises operated by women use process heat, usually generated from purchased wood or charcoal.
- High use of women's energy: The tasks in women's enterprises (e.g. spice and grain pounding) typically are physically demanding and time-consuming. Much could be done to reduce the demands on women's physical labour by the substitution of their labour by machines.
- Role of complementary inputs: Energy is one of the many inputs that influence the performance of small and medium enterprises. Women's enterprises are affected more because of the additional barriers they face in optimizing available opportunities. There are social and practical constraints related to ownership and control over productive resources, e.g. women are typically excluded/marginalized from decision making. The ability of poor women to generate livelihoods is also constrained by high marketing costs. In addition, the informal nature of these industries makes it difficult for them to access credit, equipment, market information, technical training and other support services.

Box 12: Integrated support to micro-enterprises: street food vendors in the Philippines

Since 2005, the Asia Alliance of Appropriate Technology Practitioners (APPROTECH ASIA) and its partner organizations have been implementing a pilot project with street food vendors in the metros of Philippines with financial support from UNDP and technical assistance from ENERGIA. Ninety percent of the street food vendors are women who are micro-entrepreneurs and forced to operate their small businesses against many odds, including rising prices of LPG and kerosene, no legal rights or health certification to engage in food business, illegal status, no association or other institutional set-up, and no proper homes.

The project strategy involves equipping women with a range of much-needed services, which helped them to overcome not just energy problems, but other enterprise-related problems as well. In order to deal with rising fuel prices, vendors are provided with fuel-saving and

energy-efficient stoves, improvised solar water heaters to sterilize eating and cooking utensils, and other energy technologies.

APPROTECH ASIA, through its network, has also been providing a variety of other 'non-energy' inputs. The street food vendors have been linked to the banking sector, which has agreed to extend soft loans to them. A process of certification has also been instituted and capacity-building inputs have been provided for a range of business development and energy efficiency issues.

The initiative has generated a range of benefits for the street food vendors: their business practices and attitudes have changed, savings on fuel expenditure has enabled many to expand their menus and invest in new cooking utensils, food stalls have improved, the volume of food sold has increased, and more customers have been attracted by cleaner and more appealing set-ups.

Source: From Feri Lumampao, APPROTECH ASIA (personal communication)

4

Conclusions and the way forward



Conclusions and the way forward

Access to energy is both a development issue and a gender issue because it impacts men and women in different ways

The previous discussion points to the need to extend energy provisioning across most of Asia and the Pacific, both in electricity and in cooking fuels, including LPG, kerosene and renewable fuels. Given the high complementarities between energy and development, energy and gender equity, and the impact that energy has on other basic services like water and sanitation, energy is pivotal to poverty eradication strategies and measures directed at achieving the MDGs. Access to energy is both a development issue and a gender issue because it impacts men and women in different ways. If the current situation continues, the number of people without access to electricity in 2030 will be around 1.4 billion, (only 200 million less than at present), and those that rely on traditional biomass for cooking fuel needs will be 2.6 billion, which is more than the number who use traditional biomass today (Saghir 2006). Women will be disproportionately affected.

4.1 Conclusions

- While a number of studies point to the links between gender, energy and poverty, there is need for further research to document exactly the processes and results of energy interventions. Energy is an enabler and can be a catalyst in the right conditions. What use is made of energy and whether or not women are able to take advantage of energy services (in increasing incomes, reducing drudgery and improving access to education and better health) depends on a number of factors, including social attitudes, culture and the enterprise of women themselves. Furthermore, there is a knowledge gap in the gender-energy-poverty nexus. Specific detailed studies that assess more than the initial impact of energy interventions are required before policy makers can design effective intervention strategies. In recent years, a substantial amount of research has been done, but more empirical work is needed before clear links can be established.
- The absence of gender-disaggregated data regarding energy use, supply and impact is a major hindrance towards applying methods and tools for incorporating a gender perspective in project

design and implementation. Lack of data is a key reason why there is an absence of the gender perspective at the macro level. It is also important to collect information on intra-household relationships and behaviour, as well as cultural and social attitudes, so as to fully understand the linkages between energy, gender and poverty.

- The inherent inequities between urban and rural areas, between rich and poor people, between men and women, need to be kept in mind in formulating strategies and policies. These differences in needs and socio-economic profiles will impact how energy is used and the kind of fuel that is used. Any strategy aimed at reducing poverty (especially in women-headed households) must have a built-in energy component deemed essential for improved well-being, opportunity and access.

- An integrated approach is required to address the issues of wood energy, cooking and health while recognizing the interrelationships and issues. The environmental and health impacts of the high dependence on biomass in a large number of countries cannot be overstressed. It is important for people and governments to recognize these hazards and develop sustainable energy programmes, more efficient stoves and provide cleaner fuels so that the health of women and children can be protected. The poorer the household, the greater the use of inefficient fuels and systems and the greater the risk of ill health and fatality. Any action to reduce this dependence will have a major impact on the health of women and children and bring about a stream of environmental benefits as well.

- In addition, it has been stressed that energy policy needs to recognize women's specific needs for water pumping, agricultural processing, security, work productivity and health, and the trade-offs between their domestic and income-generating activities. For example, street lighting, which improves security, has a greater impact on women's lives than that of men. Similarly, technologies that help purify water or provide refrigeration also specifically benefit women by helping to reduce time spent on domestic chores.

- Access to credit, extension services (advice on accessing credit, repayments schedules, benefits and opportunities) and training for women is critical if access to energy is to impact women's lives. Poor women find it difficult to access these resources. Credit is essential for

The environmental and health impacts of the high dependence on biomass in a large number of countries cannot be overstressed

It is important to focus on gender relations, including inequities in the access to resources, and then design appropriate energy programmes

women's domestic tasks and micro-enterprise needs. Access to credit is important for improving access to energy, but gender differences also need to be addressed. The experience from micro-credit schemes targeted at women is relevant, but credit alone cannot help in poverty reduction, in the absence of other supporting measures like training in income-generating enterprises.

- Current research shows that a participatory approach is the key to success. A project is more likely to succeed if it involves all the stakeholders in conceptualization and at the design stage and continues to do so in the implementation and evaluation stages as well. Both men and women should articulate their needs and concerns; policy makers then need to understand the gender-differentiated systems of access and control before they can make policies that give the desired results. It is important to focus on gender relations, including inequities in the access to resources, and then design appropriate energy programmes.

4.2 The way forward

Develop and use poverty- and gender-sensitive project planning and monitoring and evaluation.

An overwhelming need for capacity building and training at the national and local levels in gender mainstreaming and the designing of gender-sensitive policies and programmes is obvious from the Country Gap Assessment Reports prepared by UNDP's REP-PoR. Gender mainstreaming in energy project planning procedures requires that participatory approaches, tools and techniques should be used throughout the project cycle to ensure that all stakeholders are properly accounted for in the project.

There is a body of knowledge available on gender mainstreaming in other sectors such as water and sanitation and agriculture. Some work on gender mainstreaming has been done in the energy sector as well. UNDP, in collaboration with ENERGIA, has developed *Gender and Energy for Sustainable Development: A Toolkit and Resource Guide*. ENERGIA has also developed a set of tools for integrating gender considerations into project planning. There are other resources, such as the framework for designing, monitoring, and evaluating rural electrification projects developed under the EnPoGen project, elements of which were tested

and applied in the preparation of the World Bank/GEF Cambodia Rural Energy Project, and the Impact Evaluation Methodology and Indicators Development by the Global Village Energy partnership (GVEP). These resources need to be reviewed and adapted for energy-poverty initiatives that are implemented in the Asia-Pacific region.

Build capacities on gender mainstreaming at national and local levels.

Capacity building needs to involve a wide spectrum of people, from the community level to project implementers and policy makers.

Capacity building for gender mainstreaming needs to focus on:

- (a) **Increasing awareness**, knowledge and skills of development practitioners to integrate gender concerns into energy policies, programmes and projects; and
- (b) **Building skills** of a critical mass of men and women in the mainstream energy sector who will be involved in developing policies, programmes and practices that can impact women's energy choices.

Capacity building for gender mainstreaming should be considered at the following levels:

- **National level:** It is crucial to increase policy makers' sensitivity to gender issues. At the national level, capacity building may mean promoting and facilitating the involvement of women's organizations in decision-making processes and expanding development opportunities for their members. At this level, capacity-building efforts need to make use of advocacy backed by data and facts. Gender training should be made mandatory for all departments of the government.
- **Implementers of energy programmes:** There is a critical need for gender training of staff that work in the energy sector and on the projects. At the project level, capacity building can mean learning new skills and gaining confidence in defining community problems and designing appropriate solutions.

Gender training should be made mandatory for all departments of the government

Men need to be given the assurance that the participation of women in programmes is possible within the traditionally accepted roles

- **Village communities:** Sensitization of men is extremely important for effective participation of women in energy programmes. Men need to be given the assurance that the participation of women in programmes is possible within the traditionally accepted roles. They need to understand the benefits that accrue to women as a result of better energy access benefit the family as a whole.

Table 4: Capacity building for gender mainstreaming

Target group	Capacity-building need	Means
National policy makers	Sensitization towards gender issues. Openness to try out new methods and tools. Willingness to make space for and strengthen women staff in organizational set-up.	Advocacy through sharp and focused media and print messages. Well-structured and focused interaction with researchers and NGOs.
Implementers of energy programmes	Sensitization towards gender issues. Practical tools and techniques to incorporate women's role in planning.	Field-level workshops in local languages. Exchange visits and interaction with local organizations working on gender issues.
Village communities	For men, sensitization and assurance that women can meaningfully participate in energy programmes while respecting their traditionally accepted space and roles. Willingness to participate in the social empowerment process of women.	Exposure visits. Focus group discussions.

Source: Dutta (2003)

Provide technical assistance to mainstream gender issues in energy projects.

At the country level, project-implementing agencies should be provided ongoing technical assistance so that they can address gender concerns within the programmes that they undertake. Technical assistance is required in reviewing project documents (from a gender-mainstreaming

perspective); developing a gender-mainstreaming strategy; ensuring that planning and monitoring records and reports disaggregate participation of and the effects on men and women during the project planning and evaluation stages. Furthermore, this feedback must be used to adjust programme strategy.

Recognize sub-regional variations.

The Asia-Pacific region reflects great diversity both in terms of natural resource base and energy consumption patterns as well as in socio-cultural systems, including gender relations, which are determined by class, caste, ethnicity, age, religion, culture, size and location. Rapid economic growth in countries like Malaysia and the Philippines has meant changes in consumption patterns that approach patterns of consumption in industrialized countries. These two countries have also made progress in improving the well-being of women and in reducing gender disparities in income and access to productive resources, education and health care. In both countries, economic growth has been accompanied by the greater participation of women in the formal workforce and in a range of other activities. On the other hand, in Afghanistan and Cambodia, there are high gender imbalances and the consequences of traditional attitudes are clearly manifest in the significant gender inequities in educational attainment and levels of literacy, in the rates of child labour, access to public services, and representation in decision-making positions.

Most of the PICs have small, highly dispersed land areas and populations that are distanced from world markets, with narrow resource bases and primary commodity dependent production options. Many of these countries are remote, with small land areas and fragile land and ecosystems that are highly vulnerable to environmental threats and natural disasters, especially in the small islands and low-lying atolls. With the exception of PNG, they are sparsely populated small landmasses dispersed over large distances in the Pacific Ocean. Typically, variations within the countries are even wider than the variations between them. Many of these island economies face the same challenges common to developing countries: poverty and socio-economic inequalities within the population, unemployment, dependence on primary commodities for export earnings, and high external indebtedness. Many face high transportation and communication costs and have difficulty benefiting from economies of scale without access to export markets, and most have limited human, institutional and financial capacity and face

The Asia-Pacific region reflects great diversity both in terms of natural resource base and energy consumption patterns as well as in socio-cultural systems, including gender relations

Women's organizations can be a powerful tool for generating self-confidence and increasing social visibility among rural women

ever-increasing demographic and economic pressure on existing natural resources and ecosystems. The limited land areas in these countries, their fragile ecosystems, the pressure of growing population and rising unemployment combined with low energy access and high cost of provisioning requires specifically designed interventions. RET and sustainable development strategies are particularly suitable, but they need to be designed to factor in the unique conditions that prevail in a particular country, integrating at every stage the issues that impact women (see Table 5 for a range of possible energy interventions in selected countries of Asia and the Pacific).

Promote alternative institutional models through networking and information dissemination.

Gender mainstreaming in the energy sector needs to be advocated and highlighted through a process of information sharing, workshops and trainings. This should be done by a systematic gender assessment and documentation of selected energy projects in the region, and the dissemination of information on these, through existing networks. A regular system of interaction with women's energy networks and other women's organizations can be a powerful tool for generating self-confidence and increasing social visibility among rural women.

Box 13: Viet Nam – distributing solar home systems through the Women's Union

In Viet Nam, the Viet Nam Women's Union (VWU), a women's NGO, in partnership with the Solar Electric Light Company (SELCO), a commercial company and the Viet Nam Bank for Agriculture and Rural Development (VBARD), a development finance institution, have been disseminating solar home systems in Viet Nam since 1995. The arrangement makes use of a credit scheme, where VWU markets SELCO's systems and administers consumer loans provided by VBARD, while SELCO provides systems and is responsible for service.

The VWU has been active in the promotion of solar home systems in rural areas through its

extensive network of 11 million members. VWU is in charge of marketing, motivating households, developing material on basic maintenance, and conducting solar home demonstrations. It is also responsible for reporting problem areas that require troubleshooting, seeking support of government bodies, and identifying new project implementation sites.

VWU operates through its commune offices, allowing it to respond better to consumer needs. Its presence instills confidence in rural customers. Many of the local technicians responsible for installing the solar home systems are women.

Source: Dutta, S. and P.T. Sam (2005)

Networking is a particularly useful form of strengthening capabilities because it provides a means of spreading new ideas and sharing experiences to enhance the available knowledge base and increase expertise in energy management and technologies.

Table 5: Potential programme areas and entry point activities to address gender concerns in Asia-Pacific

China	Traditional hog rearing has been identified as an energy-intensive activity. There is a need to develop energy-saving technologies in this sector. The Women's Federation should be involved in information dissemination regarding indoor air pollution caused by biomass smoke and renewable energy technologies at various levels.
Malaysia	Initiate projects on integrated energy inputs to women-owned and operated enterprises. Document gender specific impacts and lessons on productivity and income gains from use of electricity in existing enterprises in rural areas, like rice mills, oil mills, weaving enterprises, batik and handicrafts, fish processing and agro-processing industries. The Government has set up funds for small enterprises in rural areas and should encourage these lending institutions to include energy in their loan portfolios.
Philippines	Undertake capacity development for developing, implementing and monitoring cross-sectoral (including gender) linkages within ongoing energy initiatives. Provide business development and entrepreneurship training support to women entrepreneurs. Energy entrepreneurship models that are in pilot stages in different parts of the country, such as Palawan and Aklan, have different experiences regarding the viability, the involvement of women and the resulting benefits. These need to be analysed from a gender perspective.
Mongolia	There is a high level of education and training among women. Women's involvement in the informal sector should be encouraged. Reduce the vulnerabilities faced by women-owned enterprises by (a) identifying their energy needs and addressing them; and (b) providing business development and training support in the new market economy, so as to be able to anticipate and manage risks. Develop and disseminate stoves designed specifically to meet the cooking and heating needs of herder families.

Table 5: Potential programme areas and entry point activities to address gender concerns in Asia-Pacific (continued)

Maldives	Enhance national and local capacities for gender analysis, consolidation of disaggregated data, technical expertise, and assessment of energy linkages with health, education, and income-generation activities at the national, atoll and island level. Ministry of Gender & Family to collaborate with Ministry of Atolls Development (MoAD), Ministry of Environment and Energy and Water (MEEW), UNDP and UNFPA to mainstream women's perspectives on energy. Promote specific pro-women and pro-poor interventions, such as improved cook stoves to reduce respiratory illnesses among women. Identify specific technologies, such as solar energy-run fish dryers, which can reduce women's labour and increase their productivity at work.
Viet Nam	Identify the gaps in access to energy services. Document the gender aspects of small and micro hydro projects. Develop indicators/benchmarks regarding the benefits from energy services in general and rural energy services in particular, and document the benefits of rural energy services disaggregated by income groups, by urban-rural areas and by gender. Expand credit for biogas programmes.
Sri Lanka	Identify potential areas where energy inputs can make a difference, especially in the plantation and agricultural sectors (which have high participation of women). Build awareness among the large MFIs, such as the Sarvodaya economic enterprise development services (SEEDS) and Samruddhi Bank, so that they can extend loans for the provisioning of energy services. Energy Conservation Fund (ECF), which conducts a variety of training and awareness programmes for the energy sector, should be encouraged to (a) mainstream gender concerns into its training programmes; and (b) expand to include cooking energy in its programmes (the focus currently is on electrification).
Pakistan	Undertake mapping of small-scale industries where many women work and feasibility studies (followed by interventions) on how energy inputs can help to increase productivity and profits. Brick kilns in rural areas are an example of such a sector. Promote biogas technology on a large scale.

Table 5: Potential programme areas and entry point activities to address gender concerns in Asia-Pacific (continued)

Lao PDR	Create awareness about fuel wood shortages and environmental issues. High potential for energy based entrepreneurship among women on micro- (family-sized) enterprises, such as rural food processing, handicrafts and restaurants. Identify such industries and make available training, advice and counselling to enable women entrepreneurs to understand financing mechanisms and procedures. Provide assistance in preparing feasibility studies and business plans for lending institutions. Build upon the capacity of mass organizations like the Lao Women's Union, Lao Youth Organization, Lao Trade Union and Lao Front for National Construction to promote microfinance programmes in semi-urban and rural areas. Need to identify good practices and explore microfinancing options for women and energy from previous projects such as the 'Three Sisters Project on Awareness Creation on Energy Efficiency' and the microfinance project titled 'Strengthening of Capacity of Women and Community'.
Bangladesh	Increase the productivity of small-scale poultry farms in Bangladesh, many of which are run by women, by (a) exploring the potential for improving energy services for the poultry farms; and (b) providing capacity building and other necessary inputs to women.
Timor-Leste	Women's involvement in productive enterprises and energy needs should be mapped. Capacity building in gender and poverty-sensitive M&E should be encouraged. The potential for biogas should be assessed through feasibility studies as the country has a substantial cattle population. Effective mechanisms for the transfer of technology, knowledge and best practices from other countries need to be established.
Cambodia	The Cambodia Fuelwood Saving Project, which addresses a number of gender concerns through efficient cook stoves and sustainable charcoal production, should be extended adequate legal and regulatory support. Scale up and promote low-cost technologies, such as subsidized biogas digesters and improved cook stoves in rural areas. Build up the capacities of microfinance institutions so that they expand their loan portfolios to include energy services other than electricity.

Table 5: Potential programme areas and entry point activities to address gender concerns in Asia-Pacific (continued)

Nepal	Assess the gender impacts of major energy programmes, including UNDP-initiated REDP, the SNV-supported Improved Water Mills programme being implemented by Centre for Rural Technology (CRT) and the Biogas Support Programme to develop best practices and guidelines on gender mainstreaming for energy programmes. Scale up the national biogas and cook stove programmes. Build the capacities of workers at the Village Development Committee (VDC) and District Development Committee (DDC) level, to mainstream gender and energy as cross-cutting themes into all their activities.
Pacific Island Countries	Mainstream gender into national energy policies and planning, including the provision of assistance on the implementation of existing policies at all levels from government to community. The NGOs in the Pacific Region should be encouraged to focus on gender and energy for sustainable development. Improve networking at the national and regional levels with relevant stakeholders through improved information exchange and the use of participatory methods to enhance data collection on gender and energy issues. Strengthen community-based networks and support communities through advocacy, training and implementation support. Identify and provide financial support, including micro-credit facilities for work in the energy and gender field and develop appropriate and client-oriented technologies. Information dissemination needs to be strengthened through the media and newsletters. Adequate documentation of the best practices, case studies and examples of community participation is required, as well as the need to document and report on the gender impact of different energy types, technology choices and the economic feasibility of projects. Develop an action plan to address shortage of fuel wood. There is a need for improved gender and energy capacity building at different levels through a range of methods, specifically: a) gender and energy curricula to be included at all education levels, from the primary to the tertiary level; and b) encourage more female students in technical disciplines.

Table 5: Potential programme areas and entry point activities to address gender concerns in Asia-Pacific (continued)

Pacific Island Countries (continued)	The following priority training needs have been identified: a) gender-awareness training of government, energy officers and other stakeholders; b) gender training at the community level; c) “Train the Trainer” training within communities to facilitate sustainable development; and d) seek training opportunities for women in energy technologies. Promote productive use of energy in the rural areas, especially income-generating activities or small business for women. Improve policy development and planning; identify and provide financial support for work in the gender and energy fields. National governments should take practical initiative in addressing alternative energy sources and gender issues with all stakeholders. Financial institutions need to direct resources to regional and national education institutions to build capacity and appropriate technologies for energy resources that encourage gender participation and representation. Countries need assistance to promote the use of renewable energy to ensure fuel-security in the Pacific Region.
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Sources: UNDP (2005b) and ENERGIA (2006)

An area in which existing knowledge and experience must be shared is the use of alternative institutional models within the energy sector that have demonstrated positive results. There is a need to promote new institutional models that provide women more space to articulate their concerns and needs. One option is to form self-help cooperatives. Through cooperatives, strengths and abilities of members are synergized to achieve more than the sum total of individual efforts. As seen in the women’s cooperative promoted by Prokaushali Sangsad Limited in Bangladesh (Box 9), cooperatives are particularly useful for marginalized and poorer members of the community since they can increase the bargaining power of members and can force recognition of particular issues.

There are some rural energy projects located in isolated areas and remote islands in the PICs which have experimented rather unsuccessfully with solar power, micro hydro or diesel-generation technologies. There is a need to study these and identify social and technical pre-conditions so that systems work in a sustainable manner. The example of Ha’apai, in the

There is a need to promote new institutional models that provide women more space to articulate their concerns and needs

Pacific country of Tonga, the Pacific Rural Renewable Energy France-Australia Common Endeavour (PREFACE) project demonstrates that women's participation at the management level of this SPV rural electrification initiative contributes to its success, in comparison to locations where there is no women's representation. The success of the Fiji Refrigeration Plant is also attributed substantially to the participatory approach (Box 14).

Box 14: Driti Village Solar Refrigeration Project – fish today, sell tomorrow

A successful initiative demonstrating how a solar refrigerator project improves livelihoods of communities is the Fiji Department of Energy project *Driti Village Solar Refrigeration Project* in Bua. In 2004, the Fiji Department of Energy installed nine solar panels in a refrigerator house. This enabled the Driti Community to store their harvested fish in the refrigerator, to be sold later. The project further increased flow of income for the Driti Village because they could now harvest and store more fish.

The Solar Refrigeration Project is managed by the Women's Committee. One of the

requirements of the project is that the Committee pays a monthly repair and replacement fee of FJD30. The committee has established a bank account where the monthly operational and maintenance fee is deposited.

Through this project, the women and youth of the village have become empowered through the technical training (in terms of managing the project) and the extra income earned, which pays for education and other needs. The success of this project is attributed to the participatory approach and involvement of all groups, women, youth and men in the project.

Source: ENERGIA (2006)

Advocate policy for creating enabling conditions for women's enterprises.

Since women have very specific needs, interventions designed for them should be very specific

Since women have very specific needs, in the context of energy services for poverty reduction, interventions designed for them should be very specific. They should encompass a bundle of services that provide women with choices in terms of appropriate energy technologies and enable them to access those best suited to their requirements. In this context, policy advocacy is necessary at the regional and country levels to encourage the establishment of women's enterprises through the provision of adequate training and credit facilities. Women have

traditionally been seen, particularly by developers of technology, as only passive users and consumers of energy. Yet, women have substantial accumulated knowledge and experience (gained from using different technologies) and a clear understanding of what meets their needs. Drawing on women's experiences and working in partnership with them to develop technological solutions will ensure that these solutions have a sustained use and a viable market, since they match the needs of users who are prepared to invest their limited cash resources to acquire them. Thus, with appropriate training, women can be good energy entrepreneurs. The 'telephone ladies' of Bangladesh and the success of Grameen Shakti, the Multi-functional Platform in Mali, and the ENSIGN project are only some of the many success stories that support this statement.

An evaluation of the available literature, empirical evidence and the Gap Analysis of the Country Reports for Asia and the Pacific, show that provisioning of energy and energy services has a bundling effect and can substantially change the lives of people in general and of women and girls in particular. However, the needs of women and the impact of energy provisioning and supply on their lives is seldom, if ever, taken into account in the formulation of policy, or in the design and monitoring of programmes. Energy policy in most countries does not address the concerns and requirements of women in any significant way, although many countries have begun to recognize the issue and make appropriate changes in policy documents. There are a number of successful initiatives that have changed women's lives substantially and have brought empowerment and increased well-being, but the impact has been limited; therefore, there is an urgent need for scaling up. A conscious effort at gender mainstreaming both at the policy and project level is required.

In addition to interventions that address the specific needs of women, gender sensitization and training continues to be a big gap. Gender budgeting¹² is another tool that can be effectively used to highlight the limited access that women have to energy programmes.

Access to affordable and regular energy services is thus critical if countries in the region want to meet their MDG targets and ensure that tomorrow is indeed brighter than today for their women, who hold up at least half the sky.

Access to affordable and regular energy services is critical if countries in the region want to meet their MDG targets and ensure that tomorrow is indeed brighter than today for women

¹² Gender Budget Initiatives or Gender-Responsive Budgets are tools and processes designed to facilitate a gender analysis in the formulation of government budgets and the allocation of resources. Gender budgets are not separate budgets for women or for men. They are attempts to break down or disaggregate the government's mainstream budget according to its impacts on women and men.

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