DISCUSSION NOTE 9
Energy affordability and household energy security

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1. Household energy security challenges

*What is household energy security?*

Energy has never generally been recognised as a basic need. As a consequence, governments tend not to focus on defining some minimum level of ‘energy need’. However, a shift in thinking is beginning to emerge, as knowledge about energy poverty deepens, that this should change. There are also growing calls from a human rights perspective for access to energy services to be seen as an equity issue, and for greater attention to ensuring the poor and the vulnerable have access to energy services through energy security.

From the supply side, household energy security can be seen as ensuring the continuous availability of a variety of energy forms at a price affordable to low income households. From the demand side, as a basic minimum, a household’s energy security could be conceived as having sufficient energy daily to cook enough food to meet nutritional needs and boil enough water for drinking and hygiene purposes. Below this level, households can be considered to be in energy poverty. The minimum could be extended to include lighting, an aspect that helps move people from a situation where their lives are governed by what can be achieved in daylight. However, people aspire to move beyond this very basic existence, and this is what development is intended to change. Development cannot take place without access to clean and affordable energy services. The provision of even one electric light bulb transforms people’s existence in ways that are often difficult for many urban dwellers to comprehend.

Households generally ensure their own energy security for two basic energy services (cooking and lighting) through energy management. Urban and rural households, irrespective of income level, stockpile biomass fuels even when they use commercial

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1. There is no internationally agreed definition of ‘energy poverty’. However, a working definition could be: “the absence of sufficient choice in accessing adequate, affordable, reliable, high-quality, safe, and environmentally benign energy services to support economic and human development.” (Reddy, A. K. N., ‘Energy and Social Issues’, in *World Energy Assessment*, UNDP, 2000).

2. Energy services can be defined as the desired and useful products, processes or services that result from the use of energy, e.g., illumination, comfortable indoor climate, refrigerated storage, transportation and appropriate heat for cooking.

3. An evaluation of a solar lantern project in rural Afghanistan found that men and women, when discussing household issues at night, were now able to see each other’s faces which was felt to bring a better understanding about what was being said, and to reduce tensions (Giving Light and Hope in Rural Afghanistan: The Impact of Norwegian Church Aid’s Barefoot Approach on Women Beneficiaries, Standal, K., University of Oslo, 2008).
fuels. Urban households in the Philippines, for instance, receive regular biomass supplies from rural family members. Women juggle household budgets to ensure they have enough spare cash for candles and kerosene.

Households respond to energy shocks by adopting a number of strategies to fulfil their short-term objectives of ensuring sufficient food, fuel and clothing. They have three options: (i) shift to using cheaper energy sources, (ii) reduce overall energy consumption (iii) reduce non-energy expenditure (such as by withdrawing children from school). The management decisions people make in response to energy shocks include eating fewer cooked meals (with associated health impacts), reducing travel to their home villages when it becomes too expensive (reducing contact with family and kinship networks, so disrupting social networks and reducing social capital), and cutting back on entertainment (reducing quality of life and access to information, including news, which can undermine feelings of national identity). A survey in the Philippines found that approximately one-quarter of the urban households sampled reported changing their food preparation techniques due to increasing energy costs and, in some cases, the response was as extreme as skipping breakfast. Households also had less energy to boil water which has health implications.

Why is household energy security important?

At the micro-level, there has been a growing recognition of the role that energy can play in combating poverty through: (i) improved health; (ii) increased productivity and new opportunities for additional income; and (iii) reduced labour and time spent on household activities. These aspects are interlinked: for example, less time spent on backbreaking physical labour gives the body time to recuperate. In terms of health, the use of biomass for cooking contributes significantly to indoor air pollution, and a shortage of biomass can lead to less water being boiled, affecting the spread of water-borne diseases as well as general hygiene. Here, energy interventions could include the promotion of cleaner combustion through access to modern energy, such as electricity or LPG, and improved cook stoves. In rural areas, increases in household income could be achieved through improved agricultural production with mechanisation using diesel engines and electricity. Mechanisation can also bring other benefits: it can reduce drudgery, with positive health benefits, and it can save time that can be used for income generation or rest and recuperation.

What are the challenges in achieving energy security?

The Asia-Pacific region has a rapidly urbanising population. Since household density is greater in urban areas than in rural areas, it should potentially be easier to ensure energy availability from the supply side. However, the price that low-income households have to pay for energy can act as an access barrier to clean energy services. A World Bank study found that poor urban households spend a significant portion (15-22%) of their cash incomes on energy. The poor are often found to spend a higher

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proportion of their income on fuels than higher income households\(^7\), and this can partly be attributed to low energy efficiency conversion equipment and low quality fuels. The poor often rely on second-hand older and, hence, more inefficient equipment.

A major challenge is to ensure equitable access to clean energy services for rural households as compared to urban households. A fundamental issue is whether biomass will continue to be part of the energy mix. Nevertheless, today the responsibility for biomass supply does not lie with the energy sector, but in forestry and agriculture, which requires cross-sectoral coordination. The higher cost of delivering modern energy sources to rural areas, compared to urban areas, is well-known. Given that rural households generally have a limited capacity to pay, the private sector often sees no financial incentive to provide services in such a scenario. NGOs do step in to provide access, for example, to cookstoves and biogas as in low income countries like Nepal and Cambodia. However, they do not have the organisational capacity and access to the necessary levels of finance to deliver to rural populations at large. State enterprises can play a role in ensuring modern energy reaches rural populations, such as those in India (LPG and electricity) and China (electricity and biogas).

Household energy security is not always a technical issue. Poor households often live with another insecurity that affects their energy security: the legality of home ownership or occupation. Many households do not have a piece of paper to prove ownership, something which is often necessary for an electricity connection. The insubstantial fabric of many low-income houses is also a barrier for the utility. Urban slum dwellers cannot get LPG or kerosene delivered because addresses are not officially registered. Rural household energy security is undermined when smallholder farmers lose their land, and landless people lose access to common land and forests to make way for biofuel projects designed to provide urban transport energy security. Not only do they no longer have access to biomass fuels but their income generation opportunities, which could be used to purchase modern energy, are also threatened.

**Where are the gender issues in household energy security?**

Another non-technical issue which plays a significant role in household energy security is ‘gender’\(^8\). In non-monetised fuel markets, where biomass is within ‘easy reach’ of the home, household energy security is generally women’s responsibility. However, as biomass becomes scarce, and its sourcing takes longer, there is a shift towards men’s involvement in fuel collection, particularly where the use of mechanised transport is required or where there are social restrictions on women’s movement outside of the household. The same occurs when households move towards the use of commercial fuels, men are involved in the adoption decision and, indeed, may actually make the final decision, to purchase fuels and any new conversion technology, as well as paying for repairs, including those used in what might be considered the ‘women’s domain’ of the kitchen. Measures taken to improve household energy security therefore need to

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8 Gender is a concept which refers to a system of socially defined roles, privileges, attributes and relationships between men and women, which are learned and not biologically determined. Gender cuts across social identity, intersecting with a variety of other identities, including class, race and ethnicity, age, religion and family structures, among others. Gender roles are not universal but vary in degree from society to society.
consider men. A cookstoves project in Bangladesh\(^9\) has useful lessons in this regard: older men were initially less interested than younger men; and special sessions for men, in places where they tend to congregate, using men as motivators and focusing on the impacts of indoor air pollution on their children, proved beneficial for dissemination.

2. Options for increasing household energy security and affordability

Do we improve household energy security by (i) increasing supply options (such as renewables), (ii) improving conversion efficiency or (iii) increasing household income, particularly that of women?

Renewable energy technologies (RETs) have generally been used in rural areas as decentralised systems. However, RETs in urban areas are more problematic since space constraints, building shadowing and theft are all concerns. Could urban community systems, with a form of service fee, be possible? While community biogas systems have generally not been successful, waste treatment, with associated environmental benefits, to generate biogas for piping to urban households could be an option.

The use of biomass for cooking in poor households is unlikely to disappear in either urban or rural households for both cost and supply uncertainty reasons. Therefore, promoting improved cookstoves and biomass supply could contribute to energy security. However, unlike with electricity access targets, countries rarely set targets for access to modern cooking fuels or improved cookstoves (indeed much of the RET focus in general tends to be on electricity, although in the Asia-Pacific region a number of countries, including India, China, Nepal and Cambodia, have had extensive biogas programmes).

RETs have high upfront costs and require some form of subsidy to reduce entry costs for low-income households. Such an approach has been very successful in Nepal and China for biogas, and in Bangladesh and Sri Lanka for solar home systems. Helping households to improve their incomes can reduce the need for subsidies, although there is no guarantee that this income will be spent on modern energy services. Energy technologies can contribute to income generation directly by powering microenterprises. Since microenterprises may not have sufficient resources for outright purchase, creative approaches to microcredit can be helpful, for example, microenterprises in Maharashtra, India, are able to pay a daily fee for a solar lantern which extends working hours\(^10\).

Helping women to reduce the time they spend on household activities, such as fuel collection and food preparation, through the introduction of labour-saving devices can create the opportunity for them to participate in microenterprises. However, one should not assume that women will always use any acquired ‘free’ time for income generating activities, nor is it always culturally acceptable for women to work outside the home. The increased uptake of improved stoves in China and India has been attributed to the possibilities for women to participate in the labour market, which is considered more valuable to the household than using women’s labour and time to collect firewood. An

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\(^9\) Commercialization of Improved Cookstoves for Reduced Indoor Air Pollution in Urban Slums of Northwest Bangladesh, 2009, Winrock International.

\(^10\) Overcoming Vulnerability to Rising Oil Prices: Options for Asia and the Pacific, 2007, UNDP.
alternative entry point might be the health impacts of indoor air pollution from stoves and kerosene lamps on children.

Energy efficiency along the supply chain can help increase household energy security both through keeping costs down and by ensuring supply continuity. At the household level, promoting energy efficiency is challenging since the factors that motivate households to adopt energy efficiency (either by fuel switching or through more efficient equipment) are complex and not necessarily price related. Management decisions involve balancing preferences and cooking habits with flexibility (influenced by access and availability) and time constraints. However, utilities could see it as in their interest (for example, to help defer capital investment or as a part of corporate social responsibility) to promote energy efficiency by servicing, if possible for free, second-hand equipment used by low-income households.

Improving energy security and affordability for the poor requires political commitment, especially a willingness to allocate resources. This can be and has been done, as in China’s rural electrification programme. The Indonesian Government has successfully promoted the replacement, as a cooking fuel, of heavily subsidised kerosene with LPG in 3kg cylinders, and at a lower level of subsidy.

3. Questions for participants

a) How can policy makers be motivated to make the right decisions in terms of household energy security and affordability to ensure the poor in general and women in particular do not live in energy poverty?

b) Solar home systems, the most popular RETs to enhance energy access, require large subsidies, even when linked to microcredit. They address lighting, income generation, communication and entertainment needs but not the major household energy services: cooking and boiling water. What initiatives can be launched for improved clean cooking systems?

c) Can the energy security of households be best served by ensuring women’s wellbeing and improved life-chances through energy services that provide improved health and education and enable their economic empowerment?

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