

**GENDER EQUITY IN ACCESS TO AND BENEFITS FROM  
MODERN ENERGY AND IMPROVED ENERGY  
TECHNOLOGIES**

**WORLD DEVELOPMENT REPORT BACKGROUND PAPER**

**EXECUTIVE SUMMARY**

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# 1 INTRODUCTION

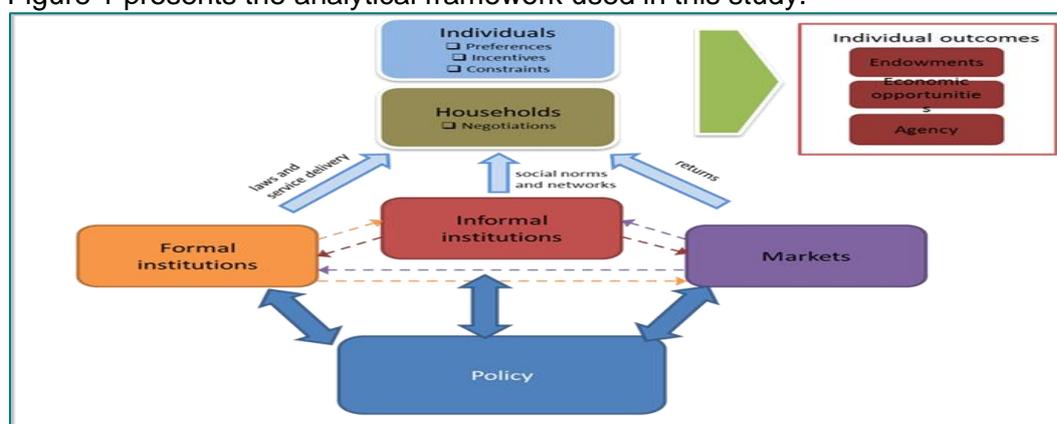
This background paper was commissioned as a contribution to the preparation of the World Development Report 2012, which will focus on development and gender equality. The paper examines the evidence as to whether or not access to modern energy and energy-efficient technologies is meeting the challenges related to tackling poverty in a gender-equitable way. In doing so, it seeks to answer the following six questions: 1) What changes are taking place in terms of women's role within the household compared to that of men? 2) How are economic opportunities for women and men influenced by access to modern energy? 3) Are gender relations affected by access to modern energy? 4) How does access to modern energy influence household members' allocation of time? 5) How do the energy services<sup>1</sup> of lighting, information and cooking provided through modern energy influence gender roles and relations? 6) What are the factors that influence access to modern energy?

## 2 METHODOLOGY

The paper is based on a desk study of the existing literature on gender and energy primarily from the last twenty years<sup>2</sup>, as well as two detailed case studies (one in South Africa and one in Zanzibar, the United Republic of Tanzania) using ethnographic approaches. The paper draws on empirically based research that focuses on *gender* (rather than women) and energy in the academic literature, reports from research institutes and international development agencies, as well as the body of sociological literature on the historical shaping of electricity systems in the North. The emphasis is on the use of findings based on research carried out using recognised scientific methods by independent observers. The data is mainly qualitative. The focus is primarily on rural areas in the group of countries collectively known as 'the South'.

The analysis focuses primarily on the modern energy sources of electricity and LPG as providing high quality and clean combustion, and offering the potential of health improvements and time savings over biomass fuels traditionally used in most poor households. However, electricity and LPG are commercial fuels that are not always readily available in rural areas, which can act as a barrier to access for poor households. For this reason, improved biomass stoves, potentially a low-cost option, are also included in the analysis since they too can offer time savings in biomass collection and health improvements from reduced indoor air pollution.

Figure 1 presents the analytical framework used in this study.



<sup>1</sup> Energy services can be defined as the desired and useful products, processes or services that result from the use of energy; for example, illumination, comfortable indoor climate, refrigerated storage, transportation, cooking (Annecke, 1999). End-users are more likely to express the requirement for an energy service than a particular energy form such as LPG.

<sup>2</sup> This period was chosen to allow for the opportunity to make the impacts of gender mainstreaming in the energy sector visible.

### **3 THE EFFECTS OF MODERN ENERGY AND MORE ENERGY-EFFICIENT TECHNOLOGIES: TRANSFORMING GENDER ROLES AND RELATIONS**

Energy services based on modern energy and improved technologies have the potential to positively influence two specific aspects of women's and men's lives: time-use, with its links to reduction in drudgery and improvements in wellbeing, and economic opportunities. These two issues are linked. Time-poverty has been increasingly recognised as a dimension of poverty. Women are particularly time-poor and the associated drudgery of their tasks mainly fulfilled through their own physical labour has implications for their health. Time-poverty also reduces opportunities for income generation. Women are more likely than men to be affected by this constraint; this would have implications for shifts in gender relations if the assertion is correct that women's status in the household improves through their increased contribution to household finances. Most of the evidence in the independent evaluation literature on gender and energy relates to electricity, with limited data on LPG and improved cook stoves. The literature provides considerable evidence of a correlation existing between energy and transformations in women's and men's lives, but causality is more difficult to prove. Most of the evidence on time-saving tends to relate to women, with only a few insights into men's activities.

#### **3.1 Timing savings and drudgery reduction**

The development interest in time-saving is linked firstly to improvements in wellbeing due to increased time for rest and reduced physical effort; and secondly to increased opportunities that can accrue for income generation. The evidence about time-saving and reduction of drudgery is mixed. In some places electric light extends the day, in other places it has no effect. However, good quality light allows women greater flexibility for managing their time.

One of the main areas of intervention to improve time-saving is to address the issue of fuelwood collection. Using improved cook stoves or alternative fuels such as LPG or alternative devices such as solar cookers does save time, but not always women's time since in some areas men are responsible for fuel collection. However, savings are frequently reported but rarely quantified. Significant saving of women's time appears to have come from the provision of labour-saving devices to meet practical needs of water-pumping and grain-grinding through mechanised community services.

There appears to be little literature on the physical impact of carrying 20kg of wood every day throughout a major part of a woman's life, beyond anecdotal evidence that it results in musculoskeletal damage and/or back pain. Women are reported to suffer sexual harassment while out collecting fuel but again this is not well documented. In urban fuelwood markets, men also carry heavy loads and are also at risk from injury. In an extensive review of the literature, the health consequences of such strenuous work were found to be a considerably under-researched field by medical science. Fuelwood collection might not always be the most onerous task for women. In Zimbabwe, women were reported to spend 4.1 hours a week on fuelwood collection and 10.3 hours on water collection.

There are three important findings related to women's time savings which are causes for concern. Firstly, women's time might be saved by an energy intervention, but it can be increased in other ways. Secondly, leisure and rest, which have been identified as vital for women's wellbeing and that of their families, seem to have the lowest priority for many women – while for men, this is their priority. Thirdly, it should not be assumed that women will automatically use any 'saved time' for income generation.

### 3.2 Income generation

The use of modern energy sources by women for income generation is probably more extensively reported in the literature than for men. However, most of the available evidence related to energy and economic opportunities has focused on access to electricity whereas women's entrepreneurial activities generally use process heat. Electricity primarily supports income generation by both women and men through the extension of the working day; this is linked with the household often being the centre of small-scale enterprises. A study in Tanzania, Bolivia and Vietnam found that locating the enterprise in the household allows women in particular to combine income-generating tasks with household duties. Men report that the level of power available at the home is often not sufficient for operate the type of equipment they would use in enterprises, such as welding gear and motors.

The evidence would tend to support the supposition that women are capable of seizing opportunities when they have the resources. However, access to modern energy alone may not be enough other than to keep women employed in producing vital, but nevertheless low-remunerative, goods and services.<sup>3</sup> It may be more important to strengthen their position, as was done in South Africa and Mali, to enable them to participate in the planning, management and operation of interventions and in markets. The consequences of the failure to do so were well illustrated in Zanzibar: a lack of gender equity in energy access. It is not only a question of ensuring that women have an appropriate set of skills, but also ensuring that women's capacity to participate is not undermined by male resistance.

### 3.3 Resistance

Not all interventions are welcomed and some are greeted with suspicion and uncertainty. Reductions in women's drudgery and time-saving can open up tensions in gender relations. In Zimbabwe, men are reported to have rejected the use of solar cookers by their wives, since technology and its development are seen traditionally as a male preserve. They expressed reservations about what their wives would do with the time saved in fuelwood collection by the introduction of solar cookers. Projects that aim to benefit women in which the dissemination mechanisms bypass men, can leave men uncertain about their new position with respect to women.

These findings illustrate the assertion that energy interventions take place in a complex context, with other dynamics at work. To reveal the dynamic to enable more effective interventions requires the researcher to become much more embedded in the community.

### 3.4 Transformatory changes in gender roles and relations

There is evidence which shows that all household members benefit from access to services delivered by modern energy sources or improved energy technologies. The distribution of benefits varies with gender and age. Women particularly benefit from help with household chores (either from reduced drudgery and/or allowing better time management of their chores). Men seem to benefit most from increased rest and entertainment. Children particularly benefit from access to TV, as well as better lighting in the home for reading, and in the streets for safety.

The available evidence shows that it is still mostly men who take the decision about acquiring modern energy technologies and fuels. So while women do not necessarily make the decision to purchase or pay for the energy, they often remain the managers of household energy and appliance use for example, women remain responsible for organising the

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<sup>3</sup> Women's income-generating activities are often found in the informal sector, selling to low-income groups.

purchase of kerosene, charging of batteries, topping-up of electricity meter pre-payment cards.

Access to modern energy appears to be enabling women to fulfil their traditional roles (to their satisfaction and wellbeing) rather than bringing significant transformation in gender roles. Men are found to carry out more domestic chores once a household acquires electricity. However, similar transitions are not reported in relation to LPG or kerosene. There is mixed evidence about more fundamental transformations in gender relations. None of the three studies on energy, poverty and gender carried out for the World Bank, in China, Sri Lanka and Indonesia, were able to show that electrification resulted in a greater voice or empowerment of women in community affairs. A possible explanation for the lack of significant transformation in gender relations is that this may require more time than changes in gender roles. A second explanation is that energy access alone is not sufficient, and other contextual factors such as legal and policy frameworks are needed to support such a change.

## **4 ENERGY TECHNOLOGIES AS DRIVERS OF TRANSFORMATION**

This paper analyses the way in which three specific energy technologies (electric light, TV and modern stoves) drive transformations in women's and men's lives.

### **4.1 Electric Light**

Within households, access to electric lighting has transformed relationships between husbands and wives by allowing them to spend more time together. Electric light also changes people's world views, particularly in relation to night-time threats. Street lighting and portable solar lanterns are perceived to provide safety against visible (e.g. wolves) and invisible (e.g. evil spirits) threats, enabling freer movement after dark. However, social norms and values do not always change as quickly as technology. Work with hill tribes in Northern India found that after the installation of street lighting, traditional perceptions about "good/bad women" continued to act as a barrier to women leaving the home after dark. This has implications for one of the often stated (intended) outcomes of rural electrification projects: that electric lights enable women to improve their literacy levels because of the possibility of attending evening classes. There is evidence to show correlation but not causality between women's literacy and the availability of electric lighting.

Another of the often stated claims for electric lighting is that it will lead to improved school performance and allow women opportunities to improve their literacy and other educational skills. Girls' life opportunities are restricted compared to boys because they are burdened with a much higher level of household chores. It can be difficult to demonstrate causality, due to the existence of other confounding factors, such as access to schools. There is also a lack of gender-disaggregated data.

Caution is required about drawing correlations and causality for the claims of electric lighting. There is some evidence that many of the activities that respondents claim to take on are not possible with the level of lighting in their homes (Ramani and Heijndermans, 2003). Indeed, there are often gaps between assumption and practice, as well as contradictions between what people say they do and what people actually do in practice.

## 4.2 Television and radio

For development practice, the interest in television and radio is linked to the types of programmes women and men watch/listen to; and in which ways the programmes influence lives in terms of wellbeing, perceptions of the world and how this influences behaviour, in particular regarding women's empowerment. There is some evidence that women in electrified households do spend time watching TV and listening to the radio – often together with men, which is considered to have strengthened women's position in the family. Both men and women report watching the news as their first programme preference. Men also like to watch sports while women enjoy a greater variety of programmes. Men still make the decision about what to watch, so their preferences have priority. Children, like their parents, use TV both as a source of education and entertainment. There is a gap in the literature about whether girls and boys watch different programmes or the types of programmes they watch.

Health care during pregnancy and for children appears to be the most common theme of health programmes aimed at women, with no references to indoor air pollution impacts on health identified. The influence of TV or other information campaigns on family size is not clear. In general, it is difficult to obtain evidence on changes in people's sexual activity since this is a highly private matter. The ethnographic evidence here is mixed; in some places, there is more intimacy between the wife and husband (e.g. Afghanistan) and in other places, less (e.g. Zanzibar). This observation is generally in line with the conclusion of the World Bank's evaluation of electrification projects.

There is no doubt that access to modern communication media transforms men and women's lives by providing a 'window' to another world, with different ways of doing things, different ways of behaving based on different values. The (desired) transformations can create further 'gender tugs-of-war' and do not always benefit women.<sup>4</sup> Rural households gain a view of urban lifestyles which creates aspirations that can lead to tensions when trying to fulfil them. There are reported gender differences in the impacts of TV and radio. A number of studies report that access to positive images and stories have changed women's (and to some extent men's) perceptions of gender roles and relations; women realise that they "*don't have to remain as second class citizens*" and they gain the confidence to challenge male authority. Whether this greater awareness of women's rights has led to a decline in domestic violence is however difficult to assess since it is considered a private matter and therefore rather sensitive for discussion with outsiders.

Again, caution is needed against drawing hasty conclusions about correlation and causality for observed changes and access to television and radio, and in making generalisations. Access to TV in communities can mainly be confined to wealthier households, while access to radio is more widespread. This makes it difficult to generalise across an entire community. What people are able to watch also depends on their location. Urban areas may have options for TV networks (either aerial or satellite), whereas a TV signal may not be available in rural areas, where the electricity supply could be insufficient for powering a satellite receiver. Having access to satellite TV or a short-wave radio increases the range of available programmes. Such opportunities open up intellectual freedom, which can be stifled where the media is subject to ideological control by the state.

## 4.3 Modern stoves

At the household level, there are three main reasons for development agencies to promote modern stoves: (i) improved health; (ii) reduction in drudgery and time saved; and (iii) for households which purchase fuels, financial savings. While these are also motivations for

<sup>4</sup> For example, women's workloads have increased because the images they see on television have created new standards for cleanliness (Standal, 2008).

households to adopt stoves, another driving force is that of status. The evidence shows that modern cook stoves as a mechanism for transformation primarily address women's practical needs and have a welfare function.

It is well-documented that indoor air pollution (IAP) from burning wood, animal dung and other biofuels is a major cause of acute respiratory infections (ARI), which constitute the most important cause of death for young children in developing countries. Through its effect on respiratory infections, indoor air pollution (IAP) is estimated to cause between 1.6 and 2 million deaths per year in developing countries – of which approximately 1 million are children. In a comprehensive review of research on IAP and interventions to reduce pollution levels it was concluded that communities most at risk exhibit low awareness of the dangers of IAP. However, it is not only women who do not make the linkages; worryingly, nurses and programme managers of health services –who are trained in western conceptualisations of illness and prioritise health issues from this perspective– do not make them either. Most of the available evidence for assessing the effectiveness of interventions to address IAP deals primarily with the effect on IAP levels rather than impacts on health. There is limited evidence about the effects as a consequence of personal exposure, which tends not to be gender disaggregated. A failure to consider gender aspects risks missing possible differences in exposure levels. Depending on culture, boys or girls will spend more time in the kitchen and hence siblings will have different exposure levels.

There are other less-reported health risks of open fires and stoves, such as burns and scalding. Children are particularly prone to accidents in the kitchen. Indeed, burns were found to be the leading external cause of death for children under the age of one in South Africa. Children are also at risk from paraffin poisoning. The most extensive studies have taken place in South Africa, where an estimated 4,000 children died from paraffin poisoning in 2000.

In the cooking cycle –from fuel collection to clearing away pots and pans– time savings primarily come from a reduction in time spent on collecting fuel. Kitchens are considered cleaner after a switch to modern fuels. Cleanliness, reduction in drudgery plus the status of switching to a modern fuel (kerosene to LPG) are reported as giving women in poor areas of Yogyakarta the feeling of modernity.

Modern stoves can have an impact on family relations, in particular on the role of women. In rural Mexico, cooking on open fires usually means that women stay alone in the kitchen while the rest of the family eats elsewhere; however, this changes when a new smokeless stove is bought. In many societies, the cooking fire is seen as the social hub of the family, allowing the women of the household to socialise with their families. This was seen as one of the reasons for the rejection of solar cookers in South Africa –since their use required a shift to cooking outdoors which can lead to a breakdown of the social web– thereby weakening women's influence within the family.

Solar cookers have attracted a lot of interest since they use a free resource, the sun. There appears to be very little impact literature on solar cookers with any sort of gender analysis. Indeed, few solar cooker projects have been independently evaluated. However, it appears that as soon as a project has ended, most people stop using their solar cookers regularly.

## **5 INFLUENCING BEHAVIOUR TOWARDS THE UPTAKE OF MODERN ENERGY AND ITS TECHNOLOGIES**

### **5.1 Determinants of and constraints to the uptake of modern energy and its technologies**

Family finances are a key determinant in the uptake of modern energy fuels and technologies. However, it is how the use of those family finances is determined, who makes the decisions, whose preferences are prioritised and how those decisions are influenced – particularly in terms of intra-household negotiation– which is very much rooted in gender relations. Therefore, any attempts to make energy interventions at the household level cannot neglect gender issues.

The value of women’s labour can be the determining factor in the uptake of improved cook stoves or fuel switches. For example, there has been a much better uptake of improved stoves in China than in India. In rural China, there are income-generating opportunities for women which are considered more valuable to the household than using women’s labour (and hence time) to collect firewood. Income-generating opportunities of a comparable level (at least at the time of the reported research) were lacking in rural India.

However, households do not always buy the energy technology themselves. Sometimes, stoves and small electrical appliances are gifts from family members. In Mexico, families use these items as a status symbol to show the family’s progress. However, it is not clear to what extent status is actually a determinant of uptake.

Unfulfilled expectations can be a deterrent to the uptake of modern energy technologies. Women in South Africa were disappointed that their solar home systems could not power their kettles or irons, which would represent time savings. Despite the extensive literature on stoves cataloguing women’s preferences for features of a stove to match their cooking practices, there still seem to be problems in designing stoves to meet expectations. Culture might be reflected in cooking practices and that this is a strong determinant in the uptake of technologies. In Mexico, LPG stoves are not suitable for cooking tortillas in the quantities required for a family meal, which considerably increases the time women must spend in the kitchen.

### **5.2 Informal and formal institutions; intra-household decision making**

The formal institution that appears to play a significant part in enabling transformations in women’s lives is the legal system. Strong laws that promote and protect women’s rights and gender equality have been shown to initiate transformations in gender roles and relations, for example, in South Africa and Tunisia. The most significant energy service in this respect is information provided by TV and radio. Both women and men are more aware of the situation, and this is leading to changes in behaviour. However, the extent of change is not always clear and men are sometimes resentful of these changes, feeling that they undermine their status.

The question that therefore arises is: why is there so little support for women’s transformation from formal institutions in the energy sector? The energy policy of most countries is gender-blind and does not provide the supporting framework that is required to meet gender needs in energy (Clancy, 2009). A good example of this blindness leading to a lack of support for appropriate interventions is the lack of awareness amongst policy-makers about the impacts of IAP. This translates into a lack of awareness-raising programmes to

promote the benefits of improved cook stoves or modern energy carriers. This is in marked contrast to the radio and TV programmes promoting infant and maternal health.

Why is energy policy gender-blind? An explanation lies in the organisations of both the energy sector and gender experts who would be involved in mainstreaming gender into energy policy and practices. Energy policy-makers tend to be men. Energy organisations both in the public and private sector, as well as civil society (such as NGOs dealing with energy) tend to be male-dominated, particularly in the professional posts. This male-dominated structure results in men talking to men about energy issues. As a consequence, the fora where the issues are identified, and any potential solutions proposed, tend to have an inadvertent male bias. Where women have held senior posts in ministries of energy, for example in South Africa and Uganda, gender issues have tended to have a higher profile.

However, gender mainstreaming requires not only an awareness of gender issues in energy, but also knowledge of procedures and ways of working by which gender matters can be incorporated in the regular process of planned development. This is the role of gender experts. However, from their side, there appears to be a reluctance to engage with the energy sector, which is in contrast to other hardware-dominated sectors such as water and ICT. This could be due to a lack of awareness of the gender issues related to energy. Firstly, there is a lack of gender-disaggregated data related to energy. Secondly, gender experts tend to have a social science background and until recently, there has been little interest in energy issues. As a consequence, ministries responsible for gender mainstreaming do not prioritise the energy sector.

Gender relations are embedded in informal institutions. It is here that we can see that there is still very limited change. Men still make the decisions about the adoption of modern energy technologies; men's preferences therefore take precedence over women's choices. The literature reviewed here provides numerous examples, such as: that a new radio will be bought before a fuel-efficient stove. Culturally, it is the perception of women (what it means to be a "good woman" or "good mother") by both women and men that acts as a constraint. While women may be respected for their knowledge about child care and other domestic matters, they can be seen to be "without knowledge" for participating in traditional decision-making fora. Therefore, at the level of the community, the lack of consultation with women about what could be construed as highly technical issues –such as electrification– becomes understandable. However, at the meso-level of energy professionals, in the context of international commitments on gender mainstreaming, that position becomes more difficult to defend.

While the acquisition of material assets can proceed relatively quickly, social attitudes towards gender relations can be slower to change; for example in rural Afghanistan, while there is growing understanding by men of women's lives through access to TV, new perceptions of women have not translated into an acceptance of girls being taught by male teachers.

Gender relations are about asymmetries of power between men and women. Power relations, and hence gender relations, change over time and under particular conditions – being subject to fluctuations of emotional and physical wellbeing, as well as in material conditions and the ability to negotiate or bargain. These negotiations take place in private spaces –the home– although they are shaped by the social context with its norms and values in which the home is embedded. The home is where women exercise their power, even though men make the decisions about many aspects of family life. In the EnPoGen study, it was reported that women in the study area had heard about new improved stoves from relatives in their mothers' villages. While men were generally said to make the decisions about such acquisitions, women persuaded their husbands to buy one of the same design. However, this is rather more a manifestation of women's agency to bring an

important improvement to their daily lives rather than representing a transformation of gender relations. Achieving gender equality is a process and as the feminist literature shows, it is not achieved without negotiation and struggle.

### **5.3 Understanding how users see issues related to energy provision and use**

Energy interventions contribute to the development discourse. An appreciation of how people experience, perceive, prioritise and respond to the various aspects of modern energy acquisition and use is crucial in understanding their reactions to development. Development is not universally welcomed by poor households since development brings with it a number of conflicts. Firstly, development is not a neutral process introduced into a neutral space; it enters a social world where traditional practices –which exist because they serve a specific and culturally valued purpose, where this purpose is explicit or hidden in rituals – are displaced. As a result, some aspects of development may be accepted, while other parts are rejected. This may be why households in rural Mexico do not completely switch to LPG but continue to keep their traditional socialising spaces (e.g. the old kitchen) and their most important traditional cooking practices which use fuelwood. From a cultural perspective, this multiple use of fuel enables people to maintain their own cultural space but also to control the direction of development.

Development is conceptualised as modernity marking a departure from the traditional, but such a departure has different meanings for different people, and this may result in tensions between individuals played out in different social spaces. At the household level, there are tensions between women and men, which have been referred to as gender tugs-of-war. These tensions are not always articulated, but manifest themselves in other ways. Men resist or do not prioritise the acquisition of energy technologies used in tasks that are considered part of women’s roles when they feel that their status and authority –legitimised as part of gender relations– is threatened. Women also fear a loss of cultural identity, for example by being judged lazy if they switch from traditional wood stoves to modern LPG.

Tensions also exist between western values of understanding and traditional ways of understanding; and when the latter predominate, it is not always to women’s advantage. For example, health professionals in South African villages used their cultural narrative to explain women’s coughs, sore eyes, etc. whereas their western narrative should have made the linkage with smoke from biomass combustion. The electricity project developers in the Zanzibar case did not challenge the cultural narrative that technology is a man’s domain and women lack ‘appropriate knowledge’ to participate in planning the electrification process. As a consequence, women’s needs were not prioritised.

## **6 CONCLUSIONS**

This paper aimed to: (i) identify gaps in the gender and energy literature; (ii) answer the six questions used to frame the research; and (iii) evaluate the contribution that ethnographic research can make to inform decision-makers in the energy sector about developing energy policy that contributes to gender equity in access to and benefit from modern energy and improved energy technologies.

The approach taken in this paper was to review only the literature that provided independent assessments of *gender* and energy projects. While this literature is not as extensive as the literature on women and energy projects, it is sufficient to draw conclusions about the outcomes of energy projects. It is not possible to fully evaluate women’s empowerment or changes in gender relations without a gender analysis. We strongly recommend that project design, implementation, and monitoring and evaluation uses and produces gender-

disaggregated data as standard practice and avoids gender-neutral terms such as ‘consumer’. This approach should even be adopted in domains such as cook stoves, that are generally assumed to be women’s sphere of influence. Gender-disaggregated data help raise awareness and ensure gender-equity goals are being met. This type of data (see below) can also offer explanations for why project outcomes appear as they do.

There are a number of gaps in the literature. Stove project evaluations in general miss gender analyses. This risks not identifying why stoves –which have obvious benefits of time-saving and reduced indoor air pollution– are either not taken up or are abandoned shortly after a project finishes. There appears to be a tendency to neglect men’s exposure to IAP due to assuming their absence from women’s space in the kitchen. It is a cause for concern since impacts on men’s health may go unrecognised and untreated. There are also no empirical studies on the impacts of modern energy or lack of it on the HIV/AIDS-infected population; and none specifically on the connections between gender, energy and major diseases such as malaria. There are very little empirical data comparable with that for IAP about the impacts on women’s health of daily carrying of heavy loads of biomass, which exceed ILO recommended safety standards, throughout their adult life. We consider that there is a need for epidemiological studies at a comparable level to that for IAP. Somewhat surprisingly, there is very little in the literature that evaluates the role of modern energy in income generation from a gender perspective. The focus has tended to be on women as entrepreneurs and the role of electricity in enterprise stimulation. The evaluation should be broadened to include men and other modern energy sources.

Access to energy provides benefits to women and men in terms of reducing the physical effort and the time taken to perform the tasks related to their practical and productive needs. In terms of gender roles, modern energy in general appears to be enabling women to fulfil their traditional roles in ways that give them satisfaction, judged according to the prevailing gender norms and values of what it means to be a “*good woman*”. However, there are some tasks usually allocated to women which men are now prepared to assist with (such as ironing and preparing snacks and drinks), when they use electricity but not LPG. Men appear to take on the tasks which do not infringe on their ideas of masculinity. Reduced physical effort through mechanisation is not always to women’s benefit since this enables women to take over men’s productive tasks, which in turn creates an opportunity for men to migrate in search of better paid work. It should not be assumed that this will lead to increased remuneration to the household. Indeed, an unintended outcome can be that men’s migration leads to women’s increased time-poverty because of the need to take on extra tasks.

In terms of changes in gender relations, there are indications of changes particularly brought about by access to electric light, television and radio. These assets result in women and men spending more time together, which is reported to improve understanding between couples and to increase women’s status. The content of programmes is important in shaping perspectives about gender relations. Television allows entry by one sex into places normally ‘forbidden’ to another because of societal norms and values. At a deeper transformatory level, television and radio educate women and men about women’s human rights. The exact contribution to reducing violence against women is difficult to correlate as are other issues related to highly personal matters such as contraception. However, research in South Africa revealed the resentment that some men have towards women’s empowerment, seeing it as a threat to men’s status; or in other words, to the balance of power relations. These tensions will probably not be resolved quickly, and transformations in gender relations should not be assumed as a short-term outcome of electrification, but rather that they may come about gradually and in the long term. Three points should be borne in mind for awareness-raising strategies: firstly, access to radio is more widespread than television; secondly, televisions tend to be owned by wealthier households; and thirdly, men’s preferences in programmes dominate.

It is men who continue to make the key decisions around major purchases, including energy

technologies related to women's sphere of influence. Therefore, energy interventions aimed at women should also involve men in shaping messages in ways that men can relate to; for example, about benefits to the household's finances.

The empirical evidence is lacking for demonstrating a correlation in the claim that energy helps meet women's strategic needs through lights in the streets and in evening classes, enabling them to build their social and political capital. This is an area which needs more exploratory research.

Support is weak among the formal institutions of the energy sector, for transforming gender roles and relations. There is a lack of involvement of women in the design, production and marketing of energy technologies targeted at women. This is not a new finding, but the situation continues to be perpetuated. In several of the studies reviewed, people wanted to be consulted beforehand about interventions.

In part, the lack of attention to gender in the energy sector can be explained by a lack of awareness of the need for gender mainstreaming due to: firstly, the lack of gender disaggregated data; secondly, the lack of awareness on the benefits to be gained from incorporating gender analysis into energy project design; and thirdly, a lack of know-how on gender mainstreaming in the energy sector. There are a number of examples of best practices that can be used to overcome these gaps. For example, Energia<sup>5</sup> has developed a methodology for engendering energy policy and organisations, while the World Bank's AFREA Gender and Energy Programme and Norad's Oil for Development and Clean Energy Programmes, are offering their partners technical assistance for gender mainstreaming at the project level.

There is still a lot we do not understand about the complex dynamics that are at play in the nexus between women, men, and energy services. We consider that there is a need for more in-depth studies to provide that understanding about what determines access to modern energy and energy-efficient technologies – and how, once acquired, these promote more gender-equitable outcomes. Moving away from the household as a unified model and examining intra-household decision-making brings “*explanatory powers far beyond those of the current model*”.

Ethnographic approaches, in which the researcher is embedded for long periods in the community, uses qualitative data gathering methods to understand the problems from the perspective of women and men in particular cultural settings. A long-term presence enhances the possibilities for gaining people's trust so that they are more prepared to share their concerns, desires and dilemmas, and in so doing, reveal issues that would otherwise not have been noted in questionnaire-based surveys. Ethnographic approaches are revealing about power relations and negotiations. Observation over extended periods creates opportunities to compare what people say they do and what people actually do. There are more opportunities to understand life and its contradictions, as well as the tensions between women and men from their perspective. This type of research is however not intended to displace quantitative surveys; both have their place in framing energy policy and its implementation. The complexities in terms of differences and diversity that are revealed by ethnographic research present important challenges for policy-making. However, these challenges can be met by formulating energy policies on the basis of more widespread consultation with the communities that are intended to be the beneficiaries of policy outcomes, and by allowing women and men to prioritise their needs.

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<sup>5</sup> Energia is the international network on gender and sustainable energy.