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1. Introduction

It is our great pleasure to introduce the theme of gender and energy in this special issue of *Energy for Sustainable Development* (ESD). This critical topic, or nexus of topics related to both gender and energy, has gained increased attention in academic literature, national and international discourse, and as an area of focus within international development assistance and national development planning. This discourse is a maturing field which has evolved in sophistication and analytic rigour over the years, and today is recognised as one of the most pressing sets of issues related to rural energy service provision, economic empowerment of women and communities, local health and environment concerns, and gender equality in access to education and health services.

Early discourse and analysis focused on the heavy burden faced primarily by women and children related to traditional fuel-use patterns, including the collection of fuels, adverse health effects from indoor air pollution, and the opportunity costs to women of productive employment missed because of the heavy burden of time spent in household cooking and heating activities. The analysis quickly gained sophistication, broadening to include a clearer understanding of the differentiated energy-use patterns of men and women based on the social and economic division of labour as part of gender analysis in the development field. In many countries it was observed that traditional fuel use and energy-using subsistence activities ("non-productive" activities) were more common among women, while the use of modern, traded fuels and energy services used for income-earning or productive activities was more concentrated among men. This led to extensive activities focused on women, improved stoves and cooking patterns as a means of liberating women from subsistence activities. While excellent work in terms of advocacy on the importance of these issues was achieved, the incorporation of these concerns in domestic policy frameworks was lacking.

More recently both energy analysis and development assistance in this field has focused on a more complex understanding of the relation between gender and energy. Today's debate takes as its starting-point that both men and women are involved in productive activities requiring energy inputs, and while the burden of household energy supplies and services remains largely the responsibility of women, access to modern energy carriers, such as clean fuels and electricity, affects both men and women. What distinguishes the debate is that the availability of energy services affects men and women differently depending on the energy applications that they are most involved in. Yet most energy policy debate and legislative frameworks have taken a gender-neutral or indeed, many would argue, a gender-blind approach to energy-pricing, rural energy policy and energy technology that continues to fail women, especially in rural areas. This issue of *Energy for Sustainable Development* examines these issues in more detail and draws on global experience to trace the complex relations between gender, energy service availability and energy use. As the articles here will show, "engendered" approaches to energy service provision and energy policy can have a powerful and positive impact on women's lives and the prosperity of their families and communities, and can directly contribute to sustainable development at large.

2. Roadmap

The wake-up call for rural energy in the South can probably be attributed to the seminal report by the World Resources Institute in 1975 [Eckholm, 1975] which brought to the world's attention "the other energy crisis": the fuelwood shortages being faced by the majority of the world's population. The primary response from development assistance to this crisis

was support for wood-lot projects. These well-meaning efforts soon ran into problems because they neglected social factors. During the 1980s research began to emerge which showed that gender in particular was playing a role: for example, women usually did not own the land, they did not have the right to cut trees, or they could not control the use of the resource once the trees had been cut – ownership and resource control fell within the domain of men. These conditions in a context where women were the primary fuel collectors and traditional fuel users undermined project success. In short, an important set of gender relations were directly impacting energy outcomes.

One of the pioneers in this field, Elizabeth Cecelski, in her early work with the International Labour Organization (ILO) during the 1980s drew attention to the unique relation between women, traditional fuel use and productive opportunities. During this period rural energy, in particular, was part of both an academic discourse and a development dialogue that directly linked energy to economic development and social change. In this context, highlighting the role of women in relation to energy, in particular household energy which was taken as synonymous with cooking, was the major focus of analysis. The potential for improved energy efficiency in both fuels and appliances such as stoves was the main focus of a technical discussion. Women as the primary users of the technology were excluded from the design process, usually conducted by male engineers. However, a number of organizations, for example, the Foundation for Woodstove Development and the Household Energy Network, HEDON, realized from their field experience that there was a more sustained use and wider uptake of stoves if women were involved in the design process itself. The stoves more closely matched the users' requirements. It became a process challenge to more appropriately involve women, as users of the fuels and technology, in the project design and technology innovation process and to convince decision-makers that solutions were not always technological. However, the opportunity to address issues related to women's productive uses of energy as highlighted by Elizabeth Cecelski was missed and it was more than a decade before the international community responded.

In 1992 at the United Nations Conference on Environment and Development, global attention shifted to the concept of sustainable development. This stressed a balance between achieving economic, social and environmental objectives in ways that expanded development opportunities of present populations without sacrificing the options of future generations. The major outcome document of UNCED was Agenda 21. Chapter 24 of Agenda 21 deals with the linkages between women and sustainable development and while energy is referred to, there is no detailed treatment of this nexus. There is no chapter on energy in Agenda 21, though energy is dealt with in several of the major chapters dealing with health, protecting the atmosphere, combating deforestation, desertification, sustainable agriculture and rural development, and environmentally sound technology. In this sense energy was addressed as a means to support various devel-

opment objectives but the specific relationships between energy services, women's time, living conditions and poverty reduction were not addressed despite an emergent literature drawing attention to the issues. Energy issues were approached largely as an environmental "bad" rather than a social or economic "good". Energy problems were predominantly put in the context of climate change, but this is just one of the pressing environmental impacts related to energy systems.

In 1994, at the Fourth World Conference on Women (held in China and known as the Beijing Conference), global attention was drawn not only to the plight of women, but also significantly to the role that women can and do play in contributing to development solutions. The unequal opportunities sometimes faced by women and men because of differences in legal status and property rights in many countries was a pivotal part of the debate. The Beijing Platform for Action, under Objective K "Women and Environment", deals with women's roles as managers and users of natural resources, including fuels. It stresses the need to integrate gender concerns and perspectives in all sustainable development programmes. Energy was also considered in the context of gender, science and technology. Again, detailed attention to the relation between gender and energy, and especially modern energy services – beyond those produced by traditional fuels – was not examined. An important shift however was the recognition that women are not passive "receptors" of technology. There was a clear recognition of the need to take gender perspectives into account in policy formulation and implementation processes in general concerning the role of government in creating enabling conditions to support sustainable development, and furthermore a call to involve women more centrally in the development and application of technology that affects their material reality.

In support of the preparations for the Beijing Conference UNDP's 1995 *Human Development Report* introduced a new "gender-related development index" (GDI) to reflect gender disparities in 130 countries at differing income levels. The role of natural resources in constraining women's development options and economic choices was acknowledged. Considerable debate emerged around the need to either quantify or impute an economic value to women's unpaid work – including work related to the transport of fuels and household services such as cooking. Similarly the valuation of women's subsistence agriculture activities (which also involves energy inputs) was advocated. It was persuasively argued that women are disproportionately represented among the total number of poor people, and that increasing trends in poverty in many countries affect women more adversely than men, especially when comparing wage levels. A second UNDP publication *Energy after Rio: Prospects and Challenges* released in 1996 reviews not only the relation between gender and energy but also the role that energy played in UN global conferences until 1995. Also in the lead-up to the Beijing Conference, another landmark paper was produced by Elizabeth Cecelski in which she drew together the shifting emphasis in the energy sector to demand-side

issues and the emerging paradigm of gender and development. This paper broadened the concept of gender and energy from stoves, time-saving, wood-lots and biomass fuels, and appropriate technology to one that encompassed a broader range of issues including pricing, transport and modern energy forms, such as electricity and LPG [Cecelski, 1995].

During the preparations for Beijing, a number of women working in the energy sector realized that if progress was to be made with getting gender and energy onto the international agenda, a very focused, practical and global networked approach would be needed. These women came together in 1995 to establish ENERGIA, the international network on gender and energy. The intention was to enhance applied research on gender and energy issues, and to provide a mechanism for practitioners to exchange concrete experiences and analytic approaches. The network has grown to more than 1500 members including researchers, development experts, energy experts and gender specialists working in this field both in the South and the North. It was a unique and practical attempt to bring energy professionals and gender experts closer together in a dialogue that sometimes ran on two tracks. In particular the network aims to bridge the gap between policy-makers and those working at the grassroots.

The ninth meeting of the Commission for Sustainable Development (CSD-9) in 2001 was the first occasion when intergovernmental dialogue focused specifically on the relation between energy and multiple development issues. CSD-9 concluded that access to energy services (rather than supplies, fuels or electricity), in other words the benefits that energy provides, is an essential prerequisite for reducing poverty. The document signed at the end of CSD-9 addresses a number of gender and energy issues. This is a remarkable achievement and represents a lot of work from a dedicated group of activists.

At CSD-9, UNDP presented *Generating Opportunities: Case Studies on Women and Energy*, a document that provided a number of such concrete illustrations and suggested important considerations in energy policy and programme design that would improve the gender impacts of both. This was due to the conviction that the relation between gender and energy must be explicit, well understood, and acted upon at the policy and programme level. In selecting case-studies emphasis was placed on productive uses of energy, or those applications that improve the economic benefits to women. At the national and local level, a greater awareness of concrete linkages and operational approaches to addressing these linkages is required to expand the scale and impact of such interventions.

In 2000, world leaders agreed an ambitious set of global targets known as the Millennium Development Goals (MDGs). The first target aims to halve extreme poverty by 2015. CSD-9 had clearly shown the role energy could play in meeting that goal. The MDGs also contain goals on gender equality, maternal health and universal education. Ines Havet in this issue of ESD illustrates the detailed relationship between gender, energy and the MDGs. Like Agenda 21, the MDGs have no specific target on

energy. Instead, the relation between gender, energy and development is implicit rather than explicit. This lack of definition has made progress on the gender, energy and development nexus difficult in international debate.

The most recent global dialogue on energy was held during the World Summit on Sustainable Development (WSSD), in South Africa in 2002. Energy was indeed one of the most contentious issues discussed. As Sheila Oparaocha and Gail Karlsson describe in this issue, the final negotiated text fell short of adequately reflecting the relation between gender and energy. On a more positive note, community advocates, non-governmental organizations and dedicated networks such as ENERGIA made an impact on shaping the debate and raising awareness of the practical linkages and opportunities to address gender and energy concerns. The opportunities for global networking on these issues was enhanced and follow-up work in a number of the partnerships launched at WSSD, such as the Global Village Energy Partnership and the LP Gas Rural Energy Challenge, explicitly addresses gender and energy linkages in both household and productive uses of energy.

3. Gender and energy coming of age

There is no doubt that over the last twenty years, there has been a considerable development in our understanding of gender and energy issues and how we should address them. Household energy is no longer seen entirely as women's preserve nor as synonymous with cooking. There has been a growing body of scientific evidence about the health implications for women of working in smoky kitchens (see for example, [Smith, 1999]). Much of this work has been supported by the World Health Organisation. Others have suggested approaches for meeting rural energy needs: for example, the German Technical Cooperation Agency (GTZ) considers that the integration of household energy into other sector programmes can be an effective entry point [Anon, 1997]. However, there is still much interesting work, both at the scientific research level and at the advocacy level, to be done.

One of the confusing elements of this area of research and analysis has been the lack of distinction between activities addressing "women and energy" and those addressing "gender and energy". While the second includes the first, the first does not necessarily include the second. The reason that a gender perspective on energy production and use patterns is important is not merely that men and women often use, are affected by, or benefit from energy services differently, but more importantly because the activities of one may affect the opportunities of the other. The same energy service may indeed affect men and women differently, with different social or economic outcomes. One example is the recent emphasis placed on rural electrification, especially using household photovoltaic systems. While small amounts of electricity at home in the evening hours may improve the quality of life for some members of the family, including through illumination for reading, and entertainment and communication through radios and televisions, for other members of the family it may simply extend the working day. In the

former respect it is men, and to some extent children, who benefit most while in the latter it is women who usually bear the burden. In many cases the provision of electricity without attention to the provision of modern cooking fuels or appliances has resulted in rural electrification in fact increasing the hardship of women when the working day is prolonged while traditional fuel-use patterns remain in place. In this example, failure to understand the gender differences in the use of services that electricity provides can result in failure of the specific energy intervention to improve the lives of women and men in comparable ways. This is one of the reasons why international accords and national policies are well advised to take a gender-based approach to energy, in particular when setting targets in the provision of energy services, the type of services themselves, and the energy sources from which the services are derived.

One of the reasons why gender issues are not addressed in international accords and national policies is that doing so requires not only an awareness of gender issues in energy, but also a knowledge of procedures and ways of working by which gender matters can be incorporated in the regular process of planned development. There is also muddled thinking about objectives: planners confuse welfare, empowerment and efficiency [Skutsch, 1998]. However, a recent study for the UK's Department for International Development (DfID) shows that a gender approach in energy would be valuable from the point of view of poverty alleviation and livelihood support [Clancy et al., 2003]. The same paper points out that while there are gender-analytical tools and frameworks that are in standard use in the agriculture, health and water sectors, there is a lack of tools specifically for energy planning. The existing tools (such as the Harvard matrix and the gender analysis matrix) are hardly used by energy planners. This is at least partly because these tools are poorly adapted to the specific needs of the case, as they focus on general aspects of women's position and not the specific energy dimensions of poverty. There is a definite need to develop tools specific to the energy sector to ensure that all gender aspects are analysed. Measurable outcome indicators, for example gender-specific targets in terms of energy services availability, to monitor the results of interventions and policy impacts are also required to establish and compare benchmarks for monitoring progress. At both the national level in terms of the assignment of fiscal resources (e.g., programmes to promote low-load electricity vs. modern fuels) and in development assistance budgets at the international level, commitment of resources to achieve desired outcomes for both men and women is critical. A significant step in the development of tools for integrating gender has been a pioneering initiative by the World Bank's Asia Alternative Energy Program (ASTAE) to better understand the impacts of rural and renewable energy projects on poverty alleviation and gender equity. The Energy, Poverty and Gender Initiative (EnPoGen) has supported an exercise to develop a monitoring and evaluation framework and methodology for the design and assessment of poverty and gender impacts of rural electrification projects [Dayal and Gregory, 2002].

4. This issue

As the articles in this issue will show, the gender and energy debate has long moved beyond a simple understanding of women, fuels and stoves. While this is still an important element that daily affects the lives of hundreds of millions of women, these same lives affect energy dynamics in a multitude of other dimensions. Women must be seen as active agents of change, both in their role as technology purchasers, users and innovators, and in economic activities, political life and community organization. The case-studies show the critical role that women can play in shaping energy approaches at the community level, such as the case of the Energy Sector Management Assistance Programme (ESMAP) project in Bangladesh as described by Hasna Khan, as well as in influencing national and international political or policy dialogue on energy, as shown by Sheila Oparaocha and Gail Karlsson. Women as entrepreneurs, both sellers of energy services and sellers of products that depend on energy services for their manufacture, is a field of study of rapidly growing importance. These approaches are essential to understand and the economic, environmental and social impacts of these energy choices, exercised by women, but affecting women, men, children, and communities, often provide innovative new approaches that both empower and educate. Also, Srilatha Batliwala and Amulya Reddy well illustrate the point that women make good energy entrepreneurs.

This issue contains two landmark papers. The first by Anoja Wickramasinghe examines the complex relation between biomass and health, not merely in terms of respiratory issues linked to smoke, but broadened to include the entire fuel cycle from production, through collection and combustion, to post-combustion issues. Quantifying these relations and measuring the human health, local resource, and fiscal implications as manifested in the health-care system provide compelling evidence of the role that informed public policy can play in addressing the particular gender and energy nexus.

The second paper by Joy Clancy and Ulrike Roehr draws our attention to the common policy challenges faced by countries in the South and the North with respect to the difficulties of engendering the energy policy debate and domestic legislative and local regulatory frameworks to address gender and energy issues. While much of the gender and energy discourse has focused on the South owing to the acutely manifest importance of energy in women's lives, energy issues in richer countries also have important implications for gender relations, female political participation and sustainable development. In both cases the role of women in political life, community organizations, and families points to the important opportunities for leadership that can bring about positive change to use energy as an instrument to achieve multiple objectives linked to social justice, environmental protection and economic empowerment.

Finally one of the most insightful and inspiring conclusions that can be drawn from a number of the case-studies here is that while targeting women in energy programmes

and policies is desirable from both an equity and functional efficiency point of view, women around the world are more than passive beneficiaries: they are acting as the agents of change themselves. Their contributions in innovating technology applications, new forms of business and social organization, as well as in advocating new approaches in development assistance are leading to the harnessing of energy services in new ways that benefit not only women, but their children, families, communities and societies at large. The material presented here is testament not only to the importance of the theme of gender and energy, but also the important roles that women and men must play in using energy as an instrument to support human development.

Susan McDade and Joy Clancy

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A note from the Publisher

We have designated this issue of *Energy for Sustainable Development* "Special issue on gender and energy". It contains eight papers devoted to the theme of gender and energy. In addition, we have also included a paper on another subject, kitchen design in relation to energy and health. It is not part of the Special Issue papers because it was felt that it is not directly related to the theme of gender and energy. This article appears first; the papers on the theme of gender and energy follow.

- Amulya K.N. Reddy