THE GLOBAL ALLIANCE FOR CLEAN COOKSTOVES: IMPLICATIONS FOR SOUTH AFRICA

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ABSTRACT

The purpose of this paper is to discuss the newly launched *Global Alliance for Clean Cookstoves* with the aim of highlighting the opportunities that it represents for South Africa. The paper argues that South Africa's participation in the Alliance could support the developmental objectives of the country including: addressing equity issues related to energy poverty and health; supporting poverty alleviation efforts; supporting the Government's constitutional commitments on clean air; and developing an innovative research, development and manufacturing sector. It further cites key lessons that South Africa can learn from Peru's efforts to address indoor air pollution and concludes with a set of recommendations.

Keywords: South Africa, energy poverty, cook stove, Global Alliance, SADC

1. WHY CLEAN COOKING IN SOUTH AFRICA

Despite the fact that about 75% of South African households have access to electricity [1], an estimated four million households continue to use traditional fuels such as biomass, as well as coal and paraffin. About 20 million people daily eat food cooked using paraffin (kerosene) [2] and many of these on *unsafe* paraffin stoves, due to reasons of affordability or access to safer models. Even if South Africa were to achieve its objective of universal access to electricity by 2012 (a target that is likely to be missed [3]), millions of South Africans will continue to use these traditional fuels and unsafe appliances, for several reasons documented in studies that have shown continued use of traditional fuels and of paraffin after electrification [4,5].

Based on an assumption that 20% of South African households use solid fuels, South Africa's Medical Research Council (MRC) estimates that, in the year 2000, indoor air pollution (IAP) from the use of solid fuels in South Africa was responsible for loss of healthy life years up to 60,930 DALYs[1] (0.4% of all DALYs) and was responsible for 2,490 deaths, representing 0.5% of all deaths in that year [7]. While this number might seem low compared to other key causes of deaths in the country (such as HIV/AIDS, violent crime and traffic accidents), a number of factors make these energy related deaths meaningful in a different way. First is the equity issue surrounding the health impacts of traditional energy use, from both a gender and income inequity position. It is mostly low income women and children, and to a lesser extent men, who bear the brunt of the health burden due to the basic needs of cooking and keeping warm. This is brought into sharper focus when one considers the various low cost IAP mitigation measures.

In South Africa, since the end of Apartheid 17 years ago, there has been little progress in creating a comprehensive national programme to promote clean, safe cooking and heating across all provinces and fuel types. Efforts to date include the Low-smoke Fuels Programme [8] and Integrated Clean Household Energy Strategy [9], the most notable achievement of which was the *Basa Njengo Magogo* alternative fire lighting method for coal *mbaula* stoves. Also of note is the development and enforcement of compulsory paraffin stove standards [10] by industry, Government and civil society groups such as the Paraffin Safety Association of Southern Africa (PASASA). Such efforts, while progressive, are limited in their geographical scope, achievements and available resources and as such have had a limited impact on the critical transition to clean and safe domestic energy. However one recent international initiative, *The Global Alliance for Clean Cookstoves* (hereafter referred to as the *Alliance*), offers an opportunity to create a much needed response to this issue. The following section introduces the *Alliance*, its aims and its broad configuration.

2. THE GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

The *Global Alliance for Clean Cookstoves* was formerly announced in September 2010 by the US Secretary of State Hilary Clinton. It is a result of decades of research that have shown a correlation between the use of solid fuels and respiratory infections, in particular infant deaths from respiratory infections, poor respiratory health for women including chronic obstructive pulmonary disease (COPD) and even cancer in some areas where coal is used [11,12,13]. The *Alliance* is an initiative coordinated by the United Nations Foundation (UNF) aimed at combating the adverse effects of IAP resulting from the burning of biomass and other fuels such as coal. Members of the initiative include multi-lateral and bilateral aid

[1] DALY stands for *disability-adjusted life year*, and is a time-based measure of overall burden of disease that combines years of life lost due to premature mortality and years of life lost due to time lived in states of less than full health [6].

agencies, and governments from both developing and developed countries. While its mandate is primarily focused on reducing the health burden of IAP by introducing 100 million clean cooking stoves by 2020, it recognises the many co-benefits of clean stoves with other development needs. It also acknowledges that a technical approach alone is unlikely to optimize results since both stove development and use are affected by a myriad of cross cutting issues. To this end, it has set up a number of working groups based around specific themes. These groups include Health, Climate Research, Standards and Testing, Technology and Fuels, Finance and Investment, Carbon Finance, Reaching Consumers, Humanitarian, and Monitoring and Evaluation, and committees on Gender and on Manufacturing issues. Working groups are comprised of energy and development experts from around the world who work with household energy issues, with a particular interest in indoor air pollution and/or the related themes.

Given the number of South Africans that continue to use traditional fuels and the negative health impacts these have on their lives, the *Alliance* presents an opportunity for South Africa to reflect on household energy poverty and establish a robust, clean and safe stove programme. The following section discusses the various opportunities for South Africa to participate in the *Alliance*, with particular attention to how this aligns with domestic programmes and the country's developmental objectives.

3. THE ALLIANCE AND OPPORTUNITIES FOR SOUTH AFRICA´S ENERGY SECTOR

3.1 POVERTY ALLEVIATION AND ENERGY COSTS REDUCTION

Poverty alleviation efforts in South Africa are key to achieving a more equitable society and maximizing the benefits of democracy. The discourse on poverty alleviation often focuses on creating (new) sources of income, while neglecting savings that households can make by using resources more efficiently. From an energy perspective, poor households spend a greater proportion of their incomes on fuels and energy than middle and high income households [14]. In addition, this financial expenditure excludes the metabolic energy[2] costs that low income women, men and children spend on laborious manual tasks such as washing clothes, collecting and chopping firewood – all tasks which are otherwise electrically powered in medium and high income households.

An aspect of clean cookstoves is that they tend to be more efficient than open fires. As such, a comprehensive clean cookstoves programme in South Africa could reduce firewood consumption. For households that collect firewood free of monetary costs, this could liberate time for other productive activities or relaxation, which although neglected in development discussions is critical for well-being. For households that purchase their firewood, clean cookstoves could reduce the associated monetary costs. Considering that studies show firewood use persisting a decade after electrification [5], the poor will continue to be affected by its negative impacts on quality of life, and hence addressing how efficiently they use their firewood will have to go beyond electrification and free basic electricity quotas. Providing low income households with a range of cleaner and safer energy options could then play a crucial role in making service delivery more meaningful.

3.2 LEADING REGIONAL STANDARDS AND TESTING

For any industry, the development of product standards is an important and ongoing process. For the basic cooking and heating devices with which the *Alliance* is concerned, there has yet to be a globally recognised series of standards and testing protocols with which to certify performance and emissions. Therefore this topic is the focus of a work group within the *Alliance*, which will be responsible for advising and aiding standards development, as well as supporting the expansion of stove testing facilities and capabilities.

In this context, South Africa has already made progress in developing standards as well as legislating for their compulsory adoption through the South African Bureau of Standards (SABS), National Regulator for Compulsory Standards (NRCS) and with the cooperation of the private sector and academia. As one of the few countries in the global south with compulsory stove standards [10], South Africa has the opportunity to take the lead in this field. However, stove testing work in centres such as the University of Johannesburg SeTAR[3] Centre, CPUT Energy Institute, CSIR and SABS is as yet not fully implemented due to a lack of financing and limited human capacity. There is therefore a risk that without a coordinated effort, such work will be sidelined in favour of 'imported' standards that may not always be in line with local user's socio-cultural preferences. In addition, there is the risk of reinventing the wheel, and thus not optimizing the limited resources available in the energy sector.

3.3 MANUFACTURING AND THE VALUE CHAIN

Previously, improved cookstoves that have been promoted in sub-Saharan Africa, and particularly in SADC, have generally been those manufactured by micro-enterprise stove producers. While these have been favoured for their low cost and local employment potential, because of the dispersed nature of these local artisans and their limited training, quality control is often problematic, both in terms of appearance and performance. Further, these small scale producers often

[2] Metabolic energy refers to the human energy derived from food, and is an often ignored component of energy systems calculations [15].

[3] The Sustainable energy Technology and Research centre is based at the University of Johannesburg and is involved in the testing of basic energy systems, including stoves.

lack the skills for logistical operations and the market networks to effect a critical mass transition from open fires and unsafe stoves, to improved cookstoves at the standards required to effectively address IAP. Thus a number of agencies and countries are looking to mass produced cook stoves (cookstoves produced and marketed in the formal market), since their quality is likely to be higher and more consistent. Although currently being imported into the country, South Africa already has the manufacturing capacity to produce high quality stoves such as those already being imported and marketed in the country (Fig 1).

Figure 1: The StoveTec Wood stove, manufactured in and imported from China

There is the potential for limited job creation in the manufacturing sector, but greater employment numbers are possible throughout the whole value chain, with the need for innovative franchises across all provinces, spanning both urban and rural areas. Although manufacturing stoves in factories might appear to create fewer jobs than dispersed micro-level production, such jobs are likely to be of a better quality and more likely to impart skills that will increase the employability of staff in other manufacturing sectors.

The South African stove market is not limited to national boundaries, but could include the entire SADC region. With capacity to manufacture stoves locally for both a domestic and regional market, and its position as a significant trading partner and trendsetter in the region, South Africa's adoption of a clean stove could revolutionalise the region's household energy sector. It therefore stands to gain financially if it establishes itself as a key regional stove producer. The *Alliance* offers an opportunity to stimulate the various capacities needed to establish robust supply chains, providing advice and expertise for each aspect, from identifying consumer needs, design and manufacturing, to market stimulation and supply.

3.4 CARBON FINANCING OPPORTUNITIES

Household energy is a sub-sector that has not benefited substantially from carbon financing, either in terms of the CDM market or the voluntary offset programmes. However, the last few years have seen some changes starting with voluntary offset market opportunities and, since February 2008, the approval of some relevant methodologies has allowed improved cookstoves to be included as CDM projects.

In the last 10 years there has been increasing consensus that black carbon (i.e. soot) is an important source of radiative forcing in the atmosphere [16,17,18]. Since the burning of traditional fuels is a significant contributor to black carbon emissions, there is a need for the household energy sector to be part of mitigation actions. South Africa has one CDM registered heat retention cooking technology programme and one listed (on the dissemination of fuel efficient stoves), but with 4 million households still using traditional fuels, the potential for more projects remains vast. Even a modest target of one million households reached with improved cook stoves could yield substantial benefits in both climate change mitigation efforts and in socio-economic terms.

Based on the work of the *Alliance's* Carbon Finance and Climate work groups, South Africa has an opportunity to draw from expertise and information that can help expand the funding available for household energy projects[4].

3.5 CONSTITUTIONAL COMMITMENTS, LOCAL GOVERNMENT AND SERVICE DELIVERY

The South African constitution stipulates, among other things, that everyone has a right to an environment that is not harmful to their health and well-being and (to) have their environment protected through reasonable legislative and other measures that prevent pollution [19]. While government has been tackling some of its constitutional commitments, such as instituting environmental impact assessments and protecting natural reserves, there has been little progress in efforts to guarantee clean indoor air. Although virtually all electrified households receive free basic electricity (FBE) [20] and those off-grid free basic alternative energy (FBAE), these do not guarantee the displacement of traditional fuels. Moreover, FBAE is often inconsistently delivered both in terms of frequency and geographical coverage and includes paraffin even in situations where safe stoves are not available [4]. In addition, whilst the distribution of paraffin and even LPG as an option within FBAE may be politically attractive, their international prices are likely to continue to increase, so negating the current zero-rating of value added tax on paraffin, and putting a heavy burden on government revenue if these energy sources are to reach a critical mass of poor South Africans. Clean and safe cookstoves are also critical in view of the current efforts by local governments to provide energy efficient RDP houses, as fuel savings help reduce household energy expenditure, and efficient combustion reduces IAP.

[4] It is important to clarify here that the Alliance itself is not a financing body for projects but rather can facilitate resource mobilisation.

4. LEADERSHIP AND LESSONS LEARNED

A country that South Africa can draw lessons from when it comes to implementing national improved cookstoves programmes is Peru. Peru's household electrification rate has increased from 45% in 1990 to 79% in 2006, a rate that is similar to that of South Africa. However, realising that a majority of the poor will continue to use firewood and dung[5], the government launched the *Peru Without Smoke* campaign in 2009. This is a public private partnership initiative aimed at promoting the use of improved certified stoves in half a million households. The initiative involves various ministries[6], international and national NGOs and the private sector, and is championed by Peru's first lady. It has attained a high political profile in the last 18 months and this has given the political momentum that led to Peru being one of the founding members and one of the few country members of the *Alliance*. To further guarantee its benefits and continuation, the programme has been integrated with hand washing, nutrition and other welfare programmes related to the Millennium Development Goals. Training in stove building is a key component of the programme and individual entrepreneurs, government personnel and NGO staff are targeted for training. In addition, with support from government and international NGOs, Peru has set up cookstove testing facilities that include simulated 'typical kitchens' to ensure that laboratory testing conditions closely resemble those in the field. There is also ongoing monitoring and evaluation of the programme to help understand the benefits perceived by households, nominal reductions in IAP levels, stove abandonment rates and improper stove use monitoring. Hard and soft subsidies are provided to promote adoption and stimulate local markets which are then provided with technical support. With such an approach 126 000 improved certified cookstoves have been disseminated in Peru[7].

Other countries that have launched national cookstoves programmes include India, Bolivia and Mexico. India aims to disseminate biomass energy technologies that would provide clean cooking energy that is comparable in quality to LPG to an estimated 160 million people that continue to use traditional fuels in India [22]. In all these programmes, government's political commitment, partnerships and explicit time based targets are key to realising a focused national programme.

[5] According to Meier [21], 77% of rural households in Peru use firewood while 24% use dung for cooking.

[6] Ministries involved include the Ministry of Minerals and Energy, Ministry of Education, Ministry of Social Development, Ministry of Defence and others.

[7] These have been implemented by a variety of organizations and include some that were implemented before the re-launch of the current programme.

5. CONCLUSIONS

There is a pressing human and environmental need for the development of a basic energy sector in South Africa. Even with 75% of South African households having access to electricity, some four million still use traditional biomass fuels as well as coal and paraffin, often burned in unsafe and polluting stoves.

The *Global Alliance for Clean Cookstoves* is a recent international initiative aimed at developing a thriving global market for a new generation of safe and clean burning stoves. As a direct response to the Country's developmental agenda this paper recommends that South Africa: joins the *Alliance* as a country member; develops and implements a national clean household energy programme with a modest target of one million improved stoves by 2016; gives the programme a high political profile; and takes a regional lead in developing an innovative research, development and manufacturing sector.

An active engagement with the *Alliance* will give the country a focus and momentum to address various issues, including that of equity, to give millions of poor South Africans a safer, cleaner and healthier life. It will also help the government to work towards meeting its constitutional commitment which gives all South Africans the right to a clean environment, free of pollution. A commitment that the energy sector, the health sector and civil society must hold it accountable for.

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8. AUTHORS

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