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Examining energy sufficiency and energy mobility in the global south through the energy justice framework

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ABSTRACT

The widespread adoption of the energy justice framework notwithstanding, arguments offered have not been able to provide tangible definitions of sufficientarianism and energy mobility. Considering widening disparities on what constitutes sufficient energy (electricity) access between the global north (North America, Europe, Australia) and the global south (sub-Saharan Africa, SSA), this paper highlights the influence of 'western reality' on the energy narrative. This paper also attempts to propose a model that evaluates off-grid electrification projects (in the global south) and their ability to guarantee sufficientarianism by examining the prospects of such projects in providing connected households access (energy security and sustainability of energy supply) and mobility (transition from a lower to higher energy level through the purchase of additional electrical equipment). Furthermore, this paper explores and provides arguments on energy bullying (by industrialized nations on developing countries mostly in SSA) while also offering suggestions for improvements in Clean Development Mechanism (CDM) projects. In essence, this paper formulates the endemic problems of energy access and energy mobility (plaguing the global south) as a justice problem and further provides insight into the exacerbation of injustice and bullying exhibited by the global north. Examples from South Africa have been utilized as case study.

1. Introduction

Dominant western energy narratives mean that we lack appropriate, context sensitive definitions of "sufficient" energy and "energy mobility". In drumming up support for the adoption of renewable energy technologies in the global south, the global north has failed to highlight the continued contribution of 'dirty energy' sources to sustaining its own economy as well as the internalised benefits of research and development (R&D) for alternative energy sources. This approach is usually encouraged by public news outlets, which fail to account for renewable energy potential, electricity demand, and the effects of seasonal climatic variance on energy provision, amongst other factors [see (David, 2016; Coren, 2016; Neslen, 2015; Sims, 2016; Walker, 2017)]. What is more, these narratives are extremely influential. Western accounts of renewable energy provision influence their policies on investments in sub-Saharan Africa (SSA), the primary case study used throughout this paper, for instance. Indeed, according to the main United States development finance institution, the Overseas Private Investment Corporation (OPIC) prefer mainly to invest in solar, wind and other low-emissions energy projects (Lomborg, 2014). As a consequence, over the past five years, the OPIC has invested in more than 40 new energy projects, for which all but two were in renewables. Positive on the one hand, such approaches are open to critique. Bjorn Lomborg, the president of the Copenhagen Consensus Centre, stated, for instance, that "…if Obama spends the next $10 billion on gas electrification, he can help lift 90 million people out of poverty. If he only uses renewables, the same $10 billion can help just 20 million - 27 million people. Using renewables, we will deliberately choose to leave more than 60 million people in darkness and poverty…(KFF, 2014)." Arguably, then, the wholesale promotion of renewables can be a perverse approach and an act of "energy bullying", without consciousness of what it means to have energy sufficiency and energy mobility. We position this as a fundamental energy justice challenge.

Against this background, the paper argues that the current energy justice framework is not yet complete. Among the academic literature, we identify reluctance from energy justice scholars to establish tangible

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definitions of what constitutes sufficient energy access, a failure that may be influenced by the "access connotes sufficiency" narrative. This narrative finds support in the divergent view between the global north and the global south on energy poverty. While energy (fuel) poverty in the global north is about affordability (i.e. the ability of households to afford sufficient energy for adequate heating), in the global south, energy poverty is a problem of accessing clean energy sources for domestic uses. Thus, in the global north, sufficiency is a problem of the "ability to purchase", inherently implying that homes connected to the grid can access as much electricity as possible if they are willing to pay. This narrative is consistent with the ideal of fuel poverty where, as Katsoulakos (2011) outlines, expenditure beyond 10% of disposable income on energy (fuel) connotes energy poverty and World Bank (2017) figures, which show that electricity access for the EU is 100%, while for the OECD countries it is 99.92% (as of 2014). In contrast, for the global south, access to clean energy sources is comparatively low (less than 40%) and poverty levels are very high, especially in SSA where the figure is about 41% of the population (Baurzhan and Jenkins, 2016; World Bank, 2017). Thus, energy poverty in a global south context is a "problem of access". This ideal is supported by the dual causal link between energy and poverty, which leads to low energy demand (especially in rural areas (DME, 2009)) and the fact that electricity consumption is a function of both the ownership of electrical appliances and duration of usage (Monyei and Adewumi, 2017, p.308). Households in the global south are thus forced to exploit other means of accessing energy sources like firewood and liquid petroleum gas, which do not offer the same quality when compared to grid electricity. As a result, for non-grid homes in South Africa, over 47% are evaluated to be energy poor (using 10% of household disposable income as benchmark) (DOE, 2012).

In short, global energy and climate policy formulation is heavily construed in favour of the global north. Alongside being historically and currently responsible for the majority of greenhouse gas (GHG) emissions, the global north is also the major player in the conceptualization and formulation of climate change mitigation policies. This is not without issue. According to Moner-Girona et al. (2016), the Clean Development Mechanism (CDM) under the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC) permits industrialized countries (Annex I countries) with GHG reduction commitments to 'off-shore' investments in emissions reducing projects to developing countries as an alternative to costly reduction strategies "back home". The extent of CDM's usefulness is controversial, with widespread debate surround the ability of CDM projects in developing countries (non-Annex I countries) to guarantee sufficient energy access and energy mobility (Lim and Lam, 2014). Millock (2013) outlines that debatable issues include the low-hanging fruit argument, transaction cost, and contribution to sustainability, amongst others. As an illustration, Costa-Jnior et al. (2013) evaluate the contribution of 75 CDM projects for technology initiatives and the promotion of cleaner technologies in Brazil, showing that not more than 21% of the projects led to implementation of cleaner technologies. This led to the conclusion that CDM projects in Brazil have not encouraged a cleaner model of development.

In addition, the absence of a penalty framework that fines Annex I countries who fail to meet pre-determined emissions reduction targets has further contributed to lack of commitment to ensuring that more active steps are taken to increase the roll-outs of CDM projects with verifiable contributions to improvement in quality of life and sustainability. This view is supported by Barkindo (2006) who outlines that the developed countries did not support initiatives preceding the Kyoto Protocol agreement announcement, but rather converted to 'mechanisms for investment' such as the compensation fund and the Brazilian proposal for a clean development fund. The developed countries have thus eliminated measures that would demand sustained commitment to the increased development of sustainable energy projects in developing countries. A case in hand is Germany's default on its emissions reduction target, which would attract no penalty or fine (news24, 2017).

In light of this background, this paper makes several arguments: (1) that existing energy justice frameworks have not sufficiently explored concepts of energy sufficiency and energy mobility; (2) that the Global North has engaged in energy bullying by promoting renewable energy in the Global South while continuing to develop fossil fuels; (3) as a result, that South Africa's off-grid electrification policy is flawed; and (4) that off-grid projects in the global south should make use of features like hybrid solar-diesel technology which would give these projects greater value in providing sufficient access and in accommodating users' needs when energy demands increase over time. Following an introduction to the basics of South African energy policy, each section of our paper further develops each of these points in turn.

2. South African energy policy: an introduction

To begin, we provide an intentionally brief introduction to the South African energy policy case study referenced throughout this piece, necessary to give context to the empirical material that follows. With attention to the United Nations (UN) Sustainable Development Goals (SDGs) 7 and 11 (UN, 2015), and in mitigating the effects of the planned decommissioning of ageing power plants (Njobeni, 2017), Eskom, a South African electricity public utility, has recently stepped up its construction of additional electricity supply capacity (Eskom, 2015). The accelerated efforts by Eskom coincide with the energy crisis that has plagued South Africa since 2008, leading to massive blackouts, load shedding and huge economic losses (Shezi, 2015; Kohler, 2014). This rapid electrification program has seen electrification rate move rapidly from less than 33% (in 1990) to 58% (1996) and 90% (2016) and has succeeded largely due to various government policies and interventions (Marquard, 2007).

Yet in terms of the socio-economic background of the population, evidence suggests that electrification rates remain deeply uneven between differing ethnic groups and across urban and rural areas. For instance, across the South African provinces, household electrification rates for Black African, Coloured households, Indian/Asian population group varies significantly with 54.14% of Black African households electrified compared to 47.87% for Coloured households, 59.29% for Indian/Asian households and 77.40% for White households (STATSSA, 2015). According to the DME (2009) this necessitates government responsibility for ensuring the electrification of all its citizens, and especially the rural poor, in order to improve living conditions.

As a step towards achieving universal access to electricity by 2019, the free basic electricity (FBE) policy was introduced in 2004 to completely subsidize 50 kWh of electricity monthly for the very poor households connected to the grid (GNESD, 2018). This is in line with the 1998 energy policy White Paper, where emphasis was placed on households' access to adequate energy services for cooking, heating, lighting and communication (DOE, 2012). In addition, the Non Grid Electrification Policy Guidelines identify non-grid solar home systems (SHS) as a suitable temporary alternative to grid electricity for rural, poor and off-grid homes. In order to extend this electricity access, energy service companies (ESCO), concessionaires and service providers act on behalf of the Department of Energy (DOE) to roll out SHS delivery DME (2009).

According to the DME (2009), the SHS, which are being introduced now, should produce about 250 Wh daily and power a black and white television (for 4 h), lighting (4 h), portable radio (10 h) and phone charging points daily. The implication of this is that on average each off-grid rural poor home gets 7.5 kWh monthly from the SHS. Yet, as this paper goes on to argue, this scheme is ethically flawed, and, echoing failures of the energy justice literature, overlooks key issues of western energy bullying.