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Perspective

Caring for energy, energy to care: Exploring the energy-care nexus through examples from Sweden and India

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ABSTRACT

As the climate crisis continues to grow, there is an increasing focus both in research and policy spaces on the need and urgency of energy transitions. In this perspective, we urge scholars, policymakers and social movements to recognize the ways that care work and practices of care are intersecting with everyday experiences of energy use. Through case studies from India and Sweden, we depict how care activities and energy use intertwine in people's daily lives in ways that are often deeply gendered. These two settings serve to illustrate our argument that energy and care are and must be deeply interlinked, in two main directions: energy as enabler or disabler of care work, and care work as shaping demands on energy access. To ensure a just energy transition where care is enabled and fairly shared, care must be an inherent part of energy transition analyses.

As the climate crisis continues to grow, there is an increasing focus both in research and policy spaces on the need and urgency of energy transitions, which encompasses issues around energy production and energy use. However contrary to the techno-economic focus of energy transitions we argue along with scholars like Damgaard, McCauley and Reid [1], Groves et al [2] and Bell, Daggett and Labuski [3] that energy transitions calls for re-envisioning current conceptualizations around energy as abstract, technocratic and individualistic to a more relational understanding of energy. The latter would center around people's lived realities, everyday experiences and their roles and positionalities in the unfolding process of energy transitions. Adopting a people centered, relational understanding of energy we identify gender-energy nexus spaces as a critical area that warrants immediate research and policy attention. While gendered aspects of energy use have gained some traction within energy justice framings², we see "care" as the missing link in understanding and theorizing this nexus.

"Care" as a concept can be approached by multiple definitions. Here, we draw on the now classical definition by Fisher and Tronto [5], of care as "a species activity that includes everything that we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible" [5]. Drawing on the case of Solar Mamas in India and an ecovillage in Sweden, we study the energy-care nexus and its implications from energy production and energy use perspectives, respectively. In

this perspective, we urge scholars, policymakers, and social movements to recognize the underresearched and gendered dimension of care as well as ways that care work and practices of care are intersecting with everyday experiences of energy use.

Gendered dimensions of energy use can to a large extent be explained by gendered norms surrounding division of care work. In research focusing on the Global North, studies from for instance United Kingdom and Sweden describe how women's care responsibilities become heavier as they need to redirect domestic work to hours when electricity costs are low, as a type of demand side response with the purpose of reducing peaks in electricity use [6,7]. Masculinities are another focus, for instance energy intensive lifestyles linked to certain masculinity types (e.g., industrial/breadwinner and ecomodern) where care is less of a practice and more of an attitude of protection (the nation, the family, rather than taking care of a piece of forest, etc.) [8,9]. In research from the Global South, gender-energy nexus conceptualizations are marked by prevalence of gendered myths that often project women as a homogenous energy poor and vulnerable entities as well as altruistic and prudent environmental champions owing to their attributed innate nurturing roles [10–12]. Within rural households in the Global South, women's care responsibilities often stretch beyond the home as they engage in collection of firewood, fuel and non-timber forest products, and subsistence agriculture, while simultaneously being responsible for

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² For a snapshot of the research landscape addressing gender-energy nexus spaces through a justice lens, see Feenstra and Özerol [4].

cooking, cleaning and other allied activities [13]. Scholars have documented that well-meaning energy and climate change programs can lead to counterproductive results if they do not recognize the energy-care nexus that constraints the caregiver's ability to participate in the emerging energy transitions process [14–17].

Within the broad variety of research looking at energy and gender, we see a potential to explicitly center the often implicitly mentioned issues of care work and practices of care and how these relate to energy. The central role of care in an energy transition is acknowledged by recent Feminist Green New Deals, recognizing care as central to any functioning society in terms of economy, environment, and human life [18] and that “‘Green’ jobs should refer to all jobs related to the well-being of people and the planet, and that includes care” [19, p. 11]. Our analysis based on our respective case studies in India and Sweden emphasizes the need for acknowledging and addressing the gendered norms and the resultant power imbalances implicit in everyday practices surrounding energy use and energy production. Centering care in research, policy and practice spaces, we argue, is key to avoid unintended gendered consequences of energy transition and instead recognize the potential of care work as a path to more sustainable energy use. Reflecting on insights from our respective case sites, we offer our takes on how such centering can be done in practice.

1. Addressing the crises of care and energy in tandem

To the previous understanding of “care” as introduced by Fisher and Tronto [5] we add insights from Science and Technology Studies (STS) stressing the material components of care, recognizing that care can only be fully understood by looking at care practices in daily life [20,21] including the multi-species activities that are often part of them [22]. By care work, we refer to both paid and unpaid caring practices, recognizing the physical and/or mental efforts involved in them.

Care is devalued work in most, if not all, societies [23,24]. Cleaning homes and streets, taking care of children, elderly, sick and disabled, is work of care that tends to be displaced on marginalized members of communities: people of low castes in caste societies, migrants and working class women in modern Western societies [25–27]. The devaluation of care work has been explained partly by its association to women and the home, often unrecognized in capitalist economies [28–30].

Care is in crisis, meaning that capacities to care are strained; while care work such as “birthing and raising children, caring for friends and family members, maintaining households and broader communities” are crucial to society, capitalist economies are overusing these capacities to their deterioration [24, p. 21]. In analyses of crisis of care and crisis of ecology, it has been observed that these crises are both interlinked and exacerbate each other [24]. For instance, climate change is putting extra stress on care workers, often by adding to the workload as food and water become scarce during droughts, diseases spread in warmer climates, and heat waves make caring for children, elderly and other vulnerable groups more difficult [16]. As one way to address such heat waves, some scholars have looked at measures of increasing access to public spaces enabling caregiving in a harsh climate. For instance, when access to energy services such as heating or cooling techniques is expensive, commons like public libraries have functioned as places where parents in energy poverty can bring their children to avoid thermal stress in the United States [31]. This is an example of a public form of caring for the caregivers, giving people access to energy services (cooling) to fulfil care needs, regardless of their capacity to pay an energy bill. It touches upon our first suggestion for energy policy: energy policies should be designed around care needs and care work. For energy research, we urge scholars to explore the different ways that care is practiced or hindered when energy access is scarce.

Our other intervention in the energy-care nexus takes off from the growing field of energy and gender research. Starting from the acknowledgement that traditionally, the energy sector is dominated by

men (both in large-scale electricity production and as managers of home technologies like smart meters and solar photovoltaics) [32,33] while women are carrying out most of the care work [18], energy policies aiming to include women in the energy sector must also strive to engage with gendered norms surrounding women as sole providers of care towards a more equal distribution of care work in households and societies. Scholars have documented that a single focus on including women in the energy and climate programs has led to increased stress on many of these women as the caregiving they engage in is not decreasing [16,34,35]. For instance, Michael et al [15] use examples from India to demonstrate that even state policies and programs designed to address the gender-energy nexus spaces were unsuccessful due to the failure to acknowledge, recognize and question unequal power relations and gendered norms that attributes women the primary role of “care providers”. In this work Michael et al. critique the so-called woman empowerment scheme of the Indian government, the Prime Minister's Ujjwala Yojana, which equates ownership of a cooking stove and gas connection to woman empowerment, thereby internalizing women's role as primary care providers. They demonstrate that this program despite having the potential to ease women's workloads failed to attain its stated objectives due to lack of engagement with woman's lived realities and their positionalities in matters concerning energy use.

2. Merging ethics of care and energy justice

Although the energy-care nexus is rarely explicitly addressed, there are exceptions. For example, Damgaard, McCauley and Reid [1] bring care ethics into energy transition studies, stressing the relationality of energy systems beyond the intimate sphere of family and friends. Further, Lorenz-Meyer [36] has studied the installation of solar power in the Czech Republic, finding practices of care towards some (e.g. certain biological habitats) but not towards others (e.g. Roma communities excluded from involvement in the solar project). To both Lorenz-Meyer [36] and Damgaard, McCauley and Reid [1], the relational aspect of care is central. We see this as a much-needed focus to challenge the individualism permeating much research on energy justice and neoliberal energy policy; however, a sole focus on relationality is insufficient. It is crucial that issues of power are explicitly addressed through frameworks of justice.

Like Groves et al [2] indicate, care ethics enable an understanding of power asymmetries such as unequal vulnerabilities in relations of dependance. The focus on relationality in ethics of care can explain how certain actors hold positions of power over others, which can be used either to harm or benefit them. The responsibility to benefit rather than harm aligns with ideas of energy justice; for instance, while caregivers are dependent on energy systems to meet caring needs of others, their ability to care is also contingent upon their access to public institutions, social infrastructure like health, basic energy access etc., filtered through gender, ethnicity, and bodily abilities among others. Thus as Groves et al argues, private caring responsibilities often intersect with public relationships of dependance and interdependence [2], providing a stronger basis for energy justice related claims. Therefore, in our conceptualization of the energy-care nexus, we return to the writings of for instance Barnes [37] and Tronto [38], defining care ethics as based on justice too. We urge scholars and policymakers to bring in both care ethics and energy justice as complementary perspectives, to understand both the (energy) demands and relationality of care work, and its relations to power.

3. Exploring the energy-care nexus: examples from Sweden and India

In our own research, we look at the energy-care nexus from two slightly different angles. Using case studies from Sweden and India we have studied how care activities and energy use intertwine in people's daily lives. While the case study of the eco-village in Sweden has an

explicit user focus the Solar Mamas case study – analyzed from the perspective of the care-giver – navigates the energy use and production perspective. These two settings serve to illustrate our argument that energy and care are and must be deeply interlinked, in two main directions: energy as enabler or disabler of care work, and care work as shaping demands on energy access and production. This is often, but not always, deeply gendered.

Starting from the latter perspective, Wågström draws on theories of energy sufficiency [39,40] and “decent living” [41,42], using care needs as the defining category which any “sufficient” energy access must meet but not exceed to guarantee decent living standards [43,44]. This perspective is particularly relevant in Global Northern settings like Sweden where per capita energy use well exceeds what is needed to sustain social welfare [45,46]. Through ethnographic research in an ecovillage in Sweden³, Wågström has explored practices of care and the different types of energies enabling them⁴. In her research the multiplicity of energies is key: as stressed in literature on energy services and energy end-states, we don’t need energy per se, but the services it provides (clean clothes, food, thermal comfort, etc.) [48,49], and these services can be enabled by energies of different degrees of human work and technologies.

In the ecovillage case study, most practices of care were enabled through low uses of electricity and other forms of technologically mediated energies, using instead metabolic energies of human work. Environmental care was often carried out in tandem with communal care, for instance by gardening for communal crops using manual tools, using compost toilets rather than water closets, and limiting space heating during winter while instead dressing warm and gathering in fewer rooms. Some members of the ecovillage experienced challenges engaging in such care practices, mostly due to infrastructures that Wågström interprets as modelled to fit an ideal of an able-bodied male with high resistance to cold and no need for medication (the latter restricting access to indoor compost toilet use). This follows an unfortunate tendency within environmentalism where the sustainable future is imagined as centered around the needs and wants of an able-bodied man “that heads ‘into the wild’ in the pastoral fantasy” [50, p. 2]. This tendency, Wågström argues, is not an inherent quality of environmental care such as energy saving measures, but rather to a lack of attention to some villagers’ care needs when infrastructures for environmental care were designed. In addition, care-work in the ecovillage was regularly divided following a traditionally gendered division of work, where typically male activities (for instance, repairing bikes) were often counted as part of the community hours that all members had to engage in, while typically female activities (such as decorating a room or baking cakes) were often carried out during free time, meaning that the latter was considered work to be compensated to a lesser degree. Both types of activities contribute to the welfare of the community and foster engagement in practices of low energy uses (socializing over cake and biking rather than driving a car). In a high-energy country like Sweden, practices of care that require little energy can give important insights in how care work can and already is a path to energy transition, however it is crucial to make sure that such transition does not add extra work and strain on women and marginalized groups and that care needs of everyone are recognized.

Drawing on The Solar Mamas program by Barefoot College in India

[15], Michael examines the energy-care nexus focusing on the care-giver⁵. Gender is highly relevant since the caregiver in this context is often a woman. Contrary to the top-down approaches, Solar Mamas is an example of a bottom up, community led energy intervention that has simultaneously attempted to address the energy-care nexus while also training women to be income generators and participants in the energy transitions process. The women who are generally selected for training as Solar Mamas are illiterate women above the age of 35, belonging to remote villages in different parts of the world, confined to traditional gendered roles attributed to them by societal structures as sole care providers. Even though the Solar Mamas program primarily intends to train women as solar engineers it is complemented by a sub initiative called ‘ENRICHE’, which teaches women about reproductive health, awareness generating modules that enables them to have more control over their own bodies as well as develop an ability to assert their agency. The program at the outset itself places a special emphasis on enabling women to imagine their roles beyond that of a “wife” and a “mother”. As a result the program transcends the sole user focus largely visible in programs that address gender-energy nexus elements by capacitating these women to be participants in the energy supply chain. The Solar Mamas program, right from the design phase includes an explicit acknowledgement of gendered norms surrounding care work and deliberately attempted to disturb these by educating women around their rights while simultaneously attempting to conscientize men and young boys about reconfiguring gendered division of work and strive towards more equal distribution of care⁶. Michael argues that while the training provided to the women in the Solar Mamas program can generate income opportunities for women, the successful entry of the Solar Mamas into the renewable energy chain can be attributed to explicitly acknowledging and disturbing gendered norms surrounding care.

4. Conclusions

Scholarship around energy transitions largely centers around discussions on increased energy efficiency, switching to renewable energy technologies, and an overall decrease of energy use [40]. Through this perspective and in our research, we argue that policy pathways towards achieving energy transitions while engaging with the technological elements of increasing energy efficiency, facilitating switch to renewables as well as adopting measures to decrease energy use should not ignore the relational aspect of energy, centering around “care”. Using examples from Sweden and India we show how care becomes a significant point of intervention in gender-energy nexus spaces. We depict how measures towards decreasing and shifting energy use without explicitly engaging with gendered norms surrounding care work as well as differences in access to resources to engage in care, can adversely affect the workload and welfare implications of certain groups of people. On the other hand, through the example of Solar Mamas program we depict how gender just energy transitions can be carried out by simultaneously addressing gendered care norms, while also imparting technical training to women as solar engineers. We argue that work of care sustains our societies but if ignored in energy policy and research, energy transitions risk failing targets of just energy access and energy use as well as gender equality, since gendered norms surrounding division of care work is mirrored in energy use and access.

Energy access is superfluous if it is not used to enable the work of caregivers. If we miss this crucial energy-care link, we risk seeing more of the energy excess of the Global North fueling consumerism on the one

³ The exact location of the ecovillage is left out to keep the villagers anonymous.

⁴ The analysis of the ecovillage’s energy use and care practices presented here is based on data from participant observations and interviews, further developed in a forthcoming dissertation by Wågström [44]. See also Ekberg and Wågström [47].

⁵ The analysis of the Solar Mamas case study presented here is based on data gathered through 5 key informant interviews with Barefoot College members in addition to material from Barefoot College website.

⁶ Based on the interview with Meagan Fallon, Former CEO of Barefoot College conducted on June 3rd, 2022.

side, and a parallel energy poverty for caregivers (all over the world) on the other. As care work is often low-intense in terms of (industrially produced) energy, care work is crucial not only to sustain human welfare but also as path to energy transition. This path, however, must be *shared* by women and men alike, and *shaped* to meet all people's care needs.

In both research, policymaking as well as social movements, energy transition cannot be understood in a vacuum. Energy transition strategies affect care workers, the division of care work and the resources for it. Thus, care must be an inherent part of energy transition analyses, to ensure that good care is enabled and fairly shared in future energy systems.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Angelica Wågström reports financial support was provided by Swedish Energy Agency. Kavya Michael reports financial support was provided by Swedish Energy Agency. Kavya Michael reports administrative support was provided by IEA UsersTCP task on Gender and Energy.

Data availability

Data will be made available on request.

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