ACCELERATING SDG 7 ACHIEVEMENT

POLICY BRIEF 6
ENERGY AND SDG 10
REDUCED INEQUALITIES

POLICY BRIEF #6

ENERGY AND SDG 10 (REDUCED INEQUALITIES)

Developed by

UN DESA, ENERGIA, and TERI

In collaboration with

United Nations Development Programme, the International Energy Agency (IRENA), and the World Bank

Key Messages

Ensuring access to affordable, reliable, sustainable, and modern energy for all (SDG 7) is a key condition for reducing inequalities (SDG 10). Progress on SDG 7 is a critical tool towards achieving the principle 'Leave no one behind'. However, the linkages are not always straightforward; they get operationalised through a complex set of interactions and interdependencies across a host of other SDGs, such as SDGs 3, 4, 5, 8, and 13, involving both synergies and trade-offs (Ahlborg et al., 2015).

Unequal access to energy and low human development are highly correlated. The concept of 'energy poverty' includes 'fuel poverty' in the developed world, but it is most often applied to the developing world in the context of lack of access to electricity, and/or clean cooking fuels or technologies. More than 800 million people still lack access to electricity and close to 40 per cent of the people in the world lack access to clean cooking fuels.

Given that energy poverty and fuel poverty are issues of access and affordability, disproportionate spending on energy and use of energy efficient equipment by poorer households could worsen their poverty levels, with consequences for prevailing inequality levels. This disproportionate spending could lead to a vicious cycle of energy poverty and could in turn worsen the state of inequality by pushing poorer households into fuel debt traps. There is also the notion of relative deprivation of poorer households, when a household does not have socially and materially necessary energy services, as per the prevailing social norms and milieu (Bonatz et al., 2019).

The cost impacts of public clean energy incentive schemes may also disproportionately burden poorer taxpayers, and public money tends to favour national grid infrastructure over smaller-scale off-grid development.

Policy targets need to take into account the quality of energy access. The Multi-tier Matrix for Measuring Access to Household Electricity Supply outlines 6 different levels of energy access from 0 to 5. It is only at Tier 3 and above that there are new opportunities for productive uses that lead to poverty reduction and reduced inequality. Often, productive uses of energy result in a higher ability and willingness to pay for electricity, and can create a virtuous cycle of increasing energy consumption resulting in enhanced welfare and higher levels of human development (Pueyo and Maestre, 2019; Terrapon-Pfaff, 2018), which would generate favourable effects on poverty and inequality. Policy targets formulated for energy access should transcend a binary approach (access or not) and institute timelines and milestones for portions of the population that can graduate to Tier 5 (full) access to energy, while also acknowledging 'fuel poverty' and supporting energy efficiency investments by low-income households.

Policy makers should address the interlinkages between energy, poverty, and inequality by combining Tier 5 ('full') energy access with the promotion of productive energy use.

The distribution and quality of energy access is not only determined by socio-technical and political economic drivers operating across scales, but also by the strength of institutions at all layers of governance. The presence of effective, accountable, and inclusive institutions at all levels could significantly contribute to the energy access goals (Ahlborg et al., 2015; Trotter, 2016), thereby generating positive impacts concerning the level and extent of inequality. Social and legal structures, as well as regulatory governance conditions, contribute to energy constraints (Mertzanis, 2018) that are significantly related to SDG 16 (peace, justice and strong institutions).

Energy and SDG 10

Despite the important role that sustainable energy plays in poverty reduction, more than 800 million people still lack access to electricity and 40 per cent of the world's people still rely on solid fuels for cooking and heating (UNDP, 2017). Poor people also pay a high price—in cash or labour—for the energy they use. Moreover, they spend a much greater share of their household income on energy than do wealthy people, not only because their incomes are so much smaller, but also because the fuels and equipment they use are so much less efficient than modern fuels and equipment. No country has managed to substantially reduce poverty without greatly increasing the use of energy.

While use of modern fuels and equipment can have many positive effects on reducing inequality, these changes might generate temporary hiccups if adequate policy measures are not taken. Commercialisation and marketing of once-free traditional biomass energy sources and switching to new and modern energy sources in developing countries could bring price shocks for poorer households and accentuate the levels of prevailing inequality. Privatisation of energy services generally expands inequality.

Lack of access to energy services is a form, an outcome and a cause of poverty (Poor People's Energy Outlook, 2010).

It is a form of poverty because it restricts human capabilities to meet their needs and realise their full potential. The capability-reinforcing abilities of energy are in terms of interlinkages between energy, health, and education. Hence, an improved quality of energy supply would have a direct bearing on human capability functions, resulting in reduced inequalities.

It is an outcome of poverty because low-income individuals are limited in their financial abilities to afford goods and services that better-off fellow citizens enjoy, even if those goods and services are ultimately unsuitable or unsustainable.

And it is a cause of poverty because it "reinforces constraints in income generation potential, because many product- and service-based enterprises and public services either rely on energy or are substantially improved in their productivity, profitability, or efficiency by the introduction of improved forms of energy access." Lack of coverage of supply exacerbates the inequalities of opportunities in more remote areas. Also, the lack of quality of supply increases financial inequities, as stand-alone electricity supply and fallback options have higher costs per unit of supply and require additional investments, which can be unobtainable for the lowest income groups. Low levels of electricity supply limit the ability of women to use time-saving appliances in the household, and inequalities in access further increase gender inequities. Lack of adequate fuel supply maintains inequities through the drudgery of fuel and water collection, poor health, and time poverty, which influence many other aspects of life.

There is a positive association between provisioning of energy and labour productivity (Alam et al., 2018) and the potential of a "vicious circle" whereby "a lack of energy access leads to limited income-earning capability, which reduces purchasing power, which in turn limits the access to energy that could improve incomes" (Poor People's Energy Outlook, 2010).

Reducing the global disparity in energy is key to reducing income inequalities, gender inequalities, and inequalities in other dimensions such as rural/urban income disparities. A lack of adequate, reliable, and affordable supplies of modern energy disproportionally impacts women and children. This is more severe in rural communities, and limits women's productive opportunities, enterprise growth, and employment, exacerbating income inequality and persistent poverty. Research in this domain also reveals productive uses of energy have gender implications and women could significantly benefit from the productive application of electricity (Pueyo and Maestre, 2019), which could significantly reduce gender disparities.

Use of alternative and unsafe energy sources often has severe consequences on health, which in return

impacts poverty levels. Similar associations can be found between access to energy and levels of education and health, which would reduce inequality (Sharma, 2019).

In addition, some regions with the lowest energy consumption and greenhouse gas emissions, countries in sub-Saharan Africa and South Asia for example, are the most vulnerable to climate change impacts and will suffer the most. Sustainable energy can help build the resilience and adaptive capacity of these communities against climate change impacts and reduce inequality between and within nations. However, this synergy could be reversed if households are required to spend more on energy for their heating and cooling requirements, due to changes in climate, leading to energy vulnerabilities and aggravating the extent of inequality. This can result in poorer households' inability to acquire needed energy services to sustain a decent life, hence impairing SDG 16 (Middlemiss and Gillard, 2015).

Box 1.

Clean energy access is critical for women's health, education and productive activities and is strongly related to reducing poverty and inequality for women since in many parts of the world women spend more time than men cooking and collecting water and fuel. Improving energy access would reduce the drudgery of women's unpaid labour and care work, enabling them to access education and employment options and enhance their livelihoods. Empowering women to participate in the global economy on an equal basis with men would add US$ 12 trillion worldwide by 2025 (McKinsey Global Institute, 2015). Investment in women—women with higher levels of education and their own income lead to improvements in education, health, food, and, through increased agency, norms of gender equality for generations to come.

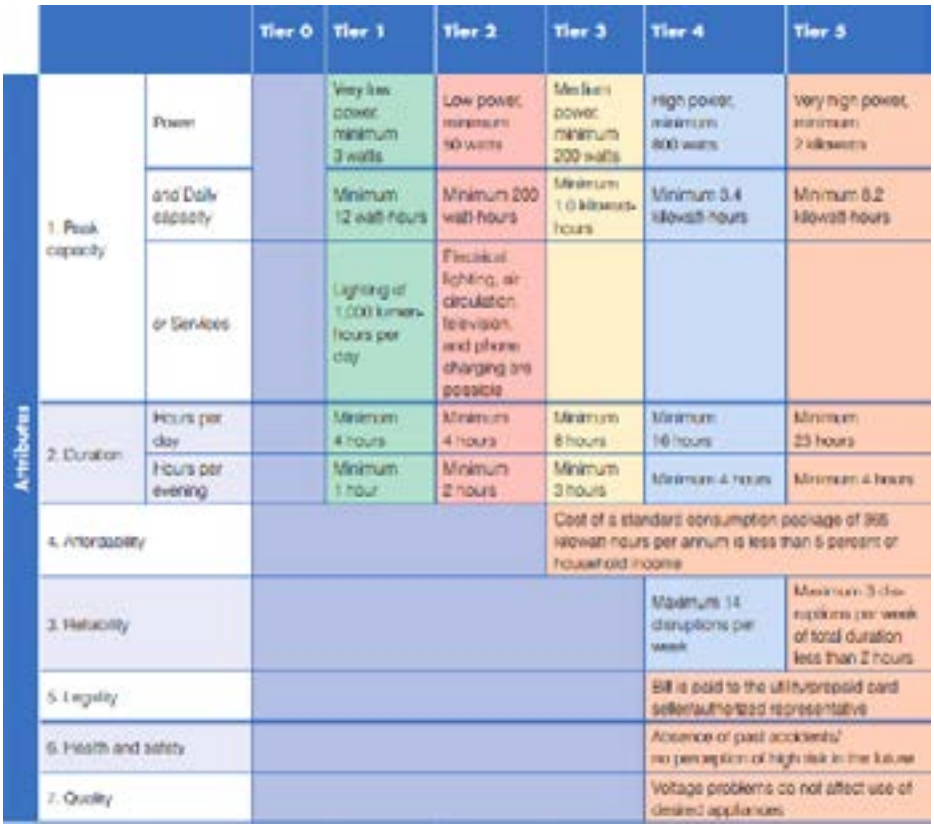
Less often discussed, but equally important is the relationship between public expenditures on clean energy development and the translation of these costs to the taxpayer. While the costs of clean energy incentive schemes are usually borne by all taxpayers, these programmes can disproportionally affect the poor if the policies are not sufficiently designed to cushion vulnerable households with social safety nets. Another crucial consideration for equal distribution of public expenditures is the far stronger focus on national grid infrastructure; small scale off-grid development is often neglected and not eligible for similar public funds allocation, as compared to national infrastructure. Often, there are distributional effects of policies, and incentives and policy instruments for clean energy sources benefit others more than the consumers, while a disproportionate share of the cost is borne by the consumers. This has equity implications, as public expenditures often do not benefit poorer households because of their low liquidity and credibility (Bonatz et al., 2019).

The tracking of progress on energy access is mainly based on a binary perception of access to energy. However, it is clear that the potential contribution of energy to income generation through productive uses depends on the supply being appropriate to opportunities for income generation, and that these opportunities are context-specific and depend on the type of enterprise. Even small amounts of electricity can open up opportunities for micro enterprise, where reliability and affordability are key. Also supply of fuels is crucial for many small and informal enterprise activities. There is a gender dimension in a focus on higher tiers of electricity as men are more often represented in types of enterprises that have higher electricity demand, while women have higher representation in enterprises with higher demand for fuels.

Higher tier electricity supply from Tier 3 onwards can be prioritised in community services and locations that attract enterprises (customers), to optimise benefits as long as Tier 5 is not yet feasible. Therefore, a step-wise approach will be the most inclusive approach to early optimisation of benefits on the path to Tier

5, or “full” energy access for all.

Figure 1. Multi-tier matrix for measuring access to household electricity supply



Source: ESMAP, 2015

SDG 7 provides opportunities to drive a transition towards clean energy access for all. However, sustainable energy in developing countries often faces technical, informational, financial, and regulatory barriers that create associated investment risks, both real and perceived.

In pre-market conditions, as in many of the poorest countries and communities, these barriers to sustainable energy can act as immediate “show-stoppers.” For example, investment is often impeded by a lack of access to affordable financing and capital scarcity due to lack of legal frameworks, underdeveloped economie,s and weak financial sectors. This presents a challenge for scaling up sustainable energy solutions, as higher returns are needed to compensate for the greater investment risks found in early-stage markets. Under these conditions, sustainable energy interventions become very sensitive to financing costs, making them less attractive and less cost-competitive than conventional solutions.

A market transformation approach is needed that assists governments in implementing combinations of public instruments that systematically target these barriers and investment risks, with the aim of cost-effectively achieving risk-return profiles that attract investment in sustainable energy at scale. An investment’s risk-return profile can be improved through reducing risk, transferring risk, or compensating for risk. Measures that reduce or transfer risk result in lower financing costs. Any residual risk may then be addressed by measures that compensate for risk. All public interventions to promote sustainable energy act in one or more of these three ways.

While creating markets through instituting incentive schemes is beneficial for the sector, considering access to energy as a marketable service could have deleterious effects on poorer households. Hence, it is equally

important that the transition to market-based approach is done in a phased manner during the transition process, as in many contexts, 'energy' for poorer households continues to be a 'merit good' with many welfare aspects (Mishra et al., 2015). Hence, it is important to consider complementariness in the policy mix, to promote uptake of energy by consumers (Rosenowa et al., 2017). The distributional analysis of policies is often neglected, resulting in undesirable socio-economic impacts (Zimmermanna, and Pye, 2018).

The public sector, or select customers (including enterprises) with the highest energy demand profile, should be aware that there may be cases where private sector engagement can lead to increased consumer prices or where energy infrastructure is solely built in areas where returns are highest. In these cases, public-private partnerships may be able to contribute to solutions that avoid this risk.

Socio-technical and political economic drivers of equity and quality of energy access across scales

The nature of energy access is determined by a variety of processes at multiple scales. These are characterised not only by techno-economic factors, but also by path dependence, incumbency, inertia, and resistance to change. At the global scale, the geopolitics of infrastructure (oil and gas trade links, multinational treaties) modulates energy transition pathways. At the national scale, energy remains a sensitive political issue, with public perceptions driving the commitments of governments, along with economic and technical concerns. At the sub-national regional scale, population demographics and intersecting factors such as class and ethnic factors matter. At the local scale, norms along religious and gendered lines determine access within communities and households.

There is growing recognition of the multi-scale and intersectional nature of the drivers of energy poverty. But it must be translated into affirmative action, adoption of transparency measures, and substantive public participation in decision making on energy services. This is necessary in order to systematically reduce inequalities in energy access and address energy poverty. Such action requires policy measures that are responsive to the political, economic, and socio-technical realities of energy within multi-scale administrative contexts (Sareen, 2017). Otherwise we run the risk of actors with entrenched interests pushing for regressive courses of action in the energy sector at great public cost.

Energy and poverty alleviation in light of fuel poverty and energy efficiency

The links between energy and poverty alleviation, as well as reducing inequalities, may be seen most obviously in the context of access to clean energy, but there are also cases of energy poverty related to "fuel poverty". The complexity of this question of poverty is that energy poverty is multidimensional and intricately connected with several aspects of human development. It has been highlighted that energy becomes catalytic for development and hence could be crucially linked with other development indicators such as health and education (Sharma, 2019). In situations where people have access to energy, it is often the poorest that end up paying disproportionate shares of their income to energy, in part because the higher upfront costs of investments in energy efficient equipment are more difficult to bear for low-income households (Simcock et al. 2017). Energy poverty widens this discussion to encompass factors related to the built environment, including reliable, safe, and comfortable access.

Fuel poverty is mainly associated with developed countries where low-income households have difficulty keeping their homes warm at a reasonable cost. However, it also relates to low-income households in developing countries, since, especially for people in the poorest countries, the most inelastic segment of demand is energy for cooking and heating to ensure basic survival. Enhancing access to modern and cleaner forms of household energy is important for this group, owing to its potential for increasing income

levels. Just as important, however, is the need to reduce their expenditures on energy services. Previous analysis has shown that in most countries poor people spend a higher share of their income on energy than the non-poor, for both electricity as fuel (IISA, 2012).

Access to energy will not alleviate poverty if it is not affordable for the lowest-income households. In some cases, tariff systems with progressive fee structures (cross-subsidies) have been introduced as solutions to this challenge. However, such solutions may also create counterproductive signals to clean energy development for low-income households. It may lead to clean energy, such as solar systems, being of most interest to households with higher utility fees, thereby creating distortions in the business model of the utility, which may lose its higher-paying customers. Careful consideration of energy price policies is needed, while alternative policies to cushion vulnerable households with social safety nets are preferred.

Electricity access and clean cooking are therefore only part of the desired policy objectives to reduce poverty. Equally important is access to energy efficient and low-cost end-use options and devices used by the poor in agro-processing, small scale value-addition processes, water pumping, housing, and transportation.

Provisioning of clean energy access is argued to have favourable employment generating effects, thereby positively links SDG 7 and 8, more through decentralised modes of energy supply (IRENA, 2018). However, clean energy transitions, often raise energy justice questions, when such transitions generate stranded fossil fuel assets and in turn have negative employment effects.

Policy recommendations

Prioritising the linkages

Given the complex and critical linkages across SDGs, it is pertinent to understand the interaction pathways and directions, which often differ depending on the contexts, urgencies, resources, and capabilities. It is important to understand the interactions in order to maximise the synergies and minimise the risks that may emanate from trade-offs.

Quality of energy access

The policy discussion on energy access must move from a binary to a qualitative understanding of access to energy. The five-tier framework of energy access can provide a graded picture to attune action to the context and emphasise the relation between quality of energy access and poverty and inequality (ESMAP, 2015). Policy targets formulated for energy access should move beyond the binary concept and set timelines and milestones for percentages of population with Tier 5 (“full”) access to energy.

Barriers to energy access improvement and their associated investment risks

In order to allow private sector financing to contribute to access to energy, thereby reducing poverty and inequality, policy makers should analyse the investment risks contributing to high financing costs and address the risks in a systemic and integrated manner. Policy de-risking instruments geared towards renewable energy uptake should be the first choice for action as these offer the most cost-effective and sustainable future solutions, while market transformation usually require a mix of policy and financial de-risking instruments, supplemented by direct financial incentives as required.

Socio-technical, politico-economic drivers of equity and quality of energy access across scales

Policy makers must act on the emerging consensus that energy poverty and inequitable access persist: (a) due to political economic factors that can be dealt with through more participatory decision-making and transparency measures in the energy sector; and (b) due to the misrecognition of socio-technical factors that modulate energy access at different scales and must be taken into account in national and regional energy policies. As cities, regions, and countries undertake energy transitions, we must utilise the opportunity to democratise this sector into one that is responsive to public interest. Regulators, administrators, and utilities alike must be held accountable for provision of quality access to clean energy in an equitable, inclusive manner.

Institutions and governance aspects of energy

Institutions are central in governing the energy transition and optimising the interlinkages. Linkages and interconnections between the SDGs could effectively governed by the institutionalisation of emerging interconnected challenges. The presence of institutions at varying scales could significantly contribute to enhanced access to energy, which would have salutary effects on reducing inequality.

Energy and poverty alleviation in light of fuel poverty and energy efficiency

The interlinkages between energy, poverty, and inequality can be addressed by policy makers by combining Tier 5 ("full") energy access with promotion of productive use of energy, but also by acknowledging the concept of "fuel poverty" and supporting for energy-efficiency investments by low-income households.

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7 AFFORDABLE AND CLEAN ENERGY