

Linking Energy Access to Carbon Emission Reductions and Subsidy Reforms

Challenges and Opportunities for the EU and the US

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1 Introduction

The lack of universal access to modern energy is one of the most pressing challenges of our time. Nearly 1.3 billion people worldwide still lack access to electricity; another billion are believed to suffer from intermittent power supply, while more than 2.6 billion rely on hazardous solid fuels for cooking (IEA 2013). These are alarming statistics and efforts are emerging at the international and national levels that aim to stimulate the necessary political will – as well as to enable social entrepreneurs and the private sector, among others – to find and implement viable solutions to this challenge.

There is much to gain by enabling universal access to energy. Human development, as measured by the human development index, increases with greater access to energy (Goldemberg, Lucon 2010, p. 92). Modern energy saves time and environmental resources and reduces daily workloads, especially for women and children, creating time to study and for social or productive activities that open up new opportunities for economic growth and development (World Bank 2008). It also reduces hazardous indoor air pollution, recently named the “kitchen killer,” which is responsible for 3.5 million deaths per year (UN 2013), more than HIV/AIDS and malaria combined. The availability of reliable and affordable electric power, however, goes well beyond these gains since it not only substitutes inefficient fuels, but establishes a resource that quickly revolutionizes lifestyles and provides new opportunities in terms of information, communication and productive uses.

Despite these and other positive effects, a number of considerable challenges to achieve universal energy access remain. First, huge investments are needed. The IEA estimates that approximately \$49 billion is needed annually to achieve “Energy for All” in 20 years, though only \$14 billion is expected. While this may provide energy access to about 1.7 billion people, the IEA also warns that global population growth will offset much of these gains in access (IEA 2013). Second, there are legitimate concerns that promoting universal access to energy will lead to increased emissions of greenhouse gases, thus accelerating global warming. The concept of climate justice – or the belief that all have the right to energy and development – is still far from universally accepted, as evidenced by the ongoing challenge of developed and developing countries finding common ground on an international climate agreement. Third, neither energy access exclusion nor the mitigation of global carbon emissions can be meaningfully addressed when inefficient energy subsidies absorb state budgets and promote wasteful consumption. Globally, \$480 billion is spent annually on energy subsidies, exacerbating both access exclusion in energy markets and global warming.

While these are significant challenges, a transatlantic strategy to address them together can yield considerable opportunities. The goal of providing universal access to modern energy can be fostered while having positive implications on

mitigating global carbon emissions as well as promoting stability in developing countries through the elimination of harmful subsidies. Unfortunately, the energy access and climate change debates are often isolated, barely interacting with each other and providing contradicting messages. While the linkage between energy security and societal stability has been widely acknowledged, the impact of mechanisms such as energy subsidies, particularly vis-à-vis energy access and climate change goals, are still not widely understood.

To unravel the Gordian knot of energy and climate justice, this policy brief seeks to provide a better understanding of the linkages between energy access, carbon emissions mitigation and subsidies and to present some initial ideas for EU-US cooperation on making universal energy access a reality. The linkages between energy access and climate are discussed in the next section before the adverse role of subsidies vis-à-vis energy access and the mitigation of carbon emissions is presented in section 3. Section 4 provides ideas about how the transatlantic alliance can move forward.¹ Section 5 concludes.

1 While this paper touches briefly on household use of energy, e.g. cooking fuels, it focuses primarily on access to electricity due to its distinct relevance for development.

2 Linking the Energy Access and Climate Change Challenges

With the multilateral system's current struggles to reach a consensus on addressing climate change, economic challenges in many Western countries, and the large investments required to reach an inclusive, equitable and more climate-friendly energy system globally, there is a strong case to be made for linking the objectives and financing mechanisms of climate change mitigation and providing energy access. As it stands, climate finance largely bypasses the energy poor from an access standpoint as it focuses on mitigating emissions in existing energy systems, urban development, industrial sectors or adaptation. However, the urgent need to accelerate the macro-transition to low-carbon energy systems in developed and emerging economies should not restrict the goal of increasing access to modern energy in developing countries. By combining these goals and mechanisms, the European Union and the United States, together with other developed countries, could potentially do much more with much less and ensure that gains made in achieving one goal do not come at the expense of another.

In their quest for economic development, countries outside of the Organization for Economic Cooperation and Development (OECD) are increasingly consuming more energy, primarily fossil fuels. As a result, the share of greenhouse gas emissions from non-OECD countries is strongly increasing and is predicted to reach 65 percent of the global total by 2030 (BP 2012). Thus, while the historical industrial policies of the OECD world are largely to blame for trends in global warming, its future mitigation largely depends on: first, reshaping emerging economies' energy and industrial policies and, second, promoting low-emission development pathways in developing countries without jeopardizing their right to economic growth and development.

Looking at energy access through a climate change mitigation lens, however, the provision of universal energy access is often confused with urbanization, industrial development, rapid growth in energy consumption and, ultimately, the acceleration of global greenhouse gas emissions. Recent research questions this assumption. First, while global carbon emissions increased by 2.9 percent in 2011 and 1.1 percent in 2012 without an integrated carbon emissions mitigation and energy access strategy (PBL Netherlands Environmental Assessment Agency 2013), the International Energy Agency (IEA) estimated in 2011 that if universal energy access is achieved by 2030, it will increase greenhouse gas emissions by a mere 0.7 percent (IEA 2011). This is only a marginal increase in global emissions compared to the potential global economic and social returns.

Second, this marginal increase in CO₂ emissions may actually be offset by the de facto elimination of additional harmful emissions of aerosols in soot, called "black carbon." Black carbon, which results from the incomplete combustion of

fossil fuels and biomass, is mainly attributable to those without access to modern sources of energy (EPA 2012 #115). These emissions are believed to have a climate change forcing impact ten times greater than previously estimated (Bond et al. 2013) and, in fact, are now estimated to be the third most harmful climate change agent after carbon dioxide and methane emissions (Wheldon 2013).² Reducing black carbon emissions in Africa and Asia through access to cleaner fuels could even lead to a net cooling effect on the global climate. Therefore, prolonged energy poverty and, as a result, suppressed development are by no means “solutions” to global warming.

If a global consensus on how to protect the climate is to be achieved, a more holistic global normative framework that includes both the mitigation of global carbon emissions and the provision of universal energy access to modern forms of energy is required. While developing countries should be encouraged to increase their use of modern and climate-friendly energy sources, developed and developing countries need to decrease their greenhouse gas emissions by reducing the carbon intensity of their energy sector and industries. Europe and the US must recognize that eliminating endemic poverty must prevail over climate concerns in developing countries’ national strategies and that global climate regimes must provide tools to approach these imbalances in the most climate-friendly manner. Climate finance as a means of global climate justice must take a central position. It can serve two vital global public policy goals – energy access and emissions mitigation – at the same time, with the same financial resources.

In sum, while it is clear that claims for full climate justice and climate equity demanded at the UN Conference on Climate Change (COP 19) in Warsaw are unacceptable to developed countries, it is also clear that least developed and developing countries will reject an agreement that does not incorporate a minimum level of global justice and compensation. Fighting energy poverty together with climate change in a more integrative framework would create common ground in the lead-up to COP 21 in Paris in December 2015 and improve the chances for a global consensus.

2 Most emissions derive from open biomass burning (40 percent), burning coal and wood in homes (24 percent) and from diesel engines (17 percent).

3 Subsidies and their Impact on Energy Access and Climate Change

A more inclusive global climate framework that links the issues of mitigation, adaptation and energy access could make considerable progress in ensuring climate justice, promoting human, economic and social development and, ultimately, reducing global carbon emissions. However, neither global warming, nor energy access exclusion can be meaningfully addressed when wasteful national energy subsidies further subvert these efforts. The impact of existing energy subsidies on global warming is so significant that it undermines policies towards low carbon development and an inclusive energy sector in developing countries.

According to the International Monetary Fund (IMF), an estimated \$480 billion is spent annually on global energy subsidies, with an estimated 60 percent of these subsidies spent in non-OECD countries. Of this total, more than two-thirds of all energy subsidies are direct fossil fuel subsidies for petroleum products, natural gas and coal, with the remaining one-third directed toward renewable electricity production (IMF 2013). Taking into consideration lost tax revenue and negative health, environmental and climate externalities, the post-tax subsidy burden reaches a staggering \$1.9 trillion.

While there are well-targeted energy subsidies to promote industries or renewables in developing countries, the bulk of global energy subsidies are a consequence of deadlocked consumer tariffs and volatile energy markets or a political commodity. As such, they are untargeted and indiscriminate, effectively incentivizing inefficient and often unproductive energy consumption. While there are many reasons for governments in developing countries to grant subsidies, for example to increase productivity in certain industries or redistribute national wealth from natural resource endowments, the reality is that they often end up contradicting their initial policy goals.

From a climate change perspective, unproductive demand incentives through artificially low energy prices contributes substantially to an increased level of greenhouse gas emissions worldwide. According to a study by the IMF, eliminating energy subsidies would lead to a 13 percent reduction in energy-related carbon-dioxide emissions (Clements et al. 2013). In addition, globally, non-climate compatible energy subsidies in 2011 were *75 times* higher than approved climate finance commitments (Whitley 2013). This statistic alone should put the subsidy burden and its implications on climate change into perspective and underscore that global warming cannot be meaningfully addressed without phasing out wasteful energy subsidies.

From a national perspective, however, the list of problems associated with and caused by consumer energy subsidies is much longer and directly impacts the failure to enable the urban and rural poor access to energy. First, poorly designed energy subsidies exasperate instability by massively increasing state budgets and distorting electricity markets. Since their bulk is deployed in an untargeted and unproductive manner, they make energy systems weaker, less equitable and less inclusive. Artificially low energy prices that do not represent the scarcity and value of resources can lead to unsustainable consumption patterns and hence demand growth rates that often cannot be satisfied by new generation capacity for which – due to the ever-increasing subsidy burden – insufficient cash-flows are available. This not only compromises service quality, it is also hazardous for state finances in the event of surges in international energy prices, as witnessed in 2008 when subsidy spending increased by 30 to 40 percent, driving many countries in North Africa to the brink of financial collapse (IMF 2013).³

Second, the vast majority of societies with consumer energy subsidies defend them regardless of the facts that influential urban classes disproportionately benefit and energy subsidies largely fail to enable affordable access to energy. According to estimates by the Global Subsidies Initiative, only around 8 percent of the subsidy benefit reaches the poorest 20 percent of society, while more than 90 percent benefits the better off (GSI/IISD 2012). This increases the divide between the well off and the poor, the urban and the rural, and leads to the nationalization of losses in the form of utility debts. Moreover, public spending on energy subsidies often prevents the provision of energy services, in particular electricity, to poor and rural people while crowding out public priority spending for social protections. This means that the energy poor often pay the highest prices for the little energy they use and are extremely vulnerable to energy price increases, which constitute a substantial part of their spending. At the same time, they lack the most tangible public services.

In sum, wasteful consumer energy subsidies not only often fail in their social purpose, but also drastically increase carbon emissions while often exacerbating social tensions. Unfortunately, the fundamental irony of subsidies' negative impact on energy access is often unrecognized. Those that suffer most, namely the rural poor, often lack a voice in political processes and politicians remain unaware of the effective subsidy burden as it is often “hidden” in diverse utility subsidiaries and off-budget vehicles.

³ For example, subsidies in the Middle East and North Africa region totaled over 8.5 percent of regional GDP and 22 percent of all government revenues (IMF 2013, p. 10). Price increases such as those in 2008 suddenly absorbed an additional 10 percent of state budgets.

4 The Way Forward

The issues of energy access, climate change and subsidies are inextricably intertwined and cannot be solved on their own; climate and access goals cannot be achieved without eliminating wasteful energy subsidies, and inclusive energy systems and climate justice can, in turn, significantly contribute to the acceptance of a global climate consensus. Thus, taking steps to link these issues and capitalize on opportunities can spark progress in achieving universal energy access and reducing carbon emissions while eliminating the harmful implications of wasteful subsidies. In this respect, through joint efforts, the EU and the US can act as powerful drivers for the development of a more conclusive global framework. In the following, we provide broad cornerstones on how to move forward in enabling universal access to energy by linking the issue with climate change and subsidy reform.

4.1 Integrating Energy Access into the Global Climate Framework

In 2012, United Nations Secretary-General Ban Ki-moon launched the Sustainable Energy for All (SE4ALL) initiative, which aims to achieve three interlinked objectives by 2030: first, ensuring universal access to modern energy services; second, doubling the rate of improvement in energy efficiency; and third, doubling the share of renewable energy in the global energy mix (Moon 2011). Moreover, universal access to modern energy ranked high in the global consultation *The World We Want*, which fed into the post-2015 development framework process. The UN has also declared 2014-2024 the “Decade of Sustainable Energy for All” (United Nations General Assembly 2012).

SE4All represents the opportunity side of the climate change coin. Globally, 65 countries have committed to the initiative’s three goals, including strong commitments from the European Commission and the US. Approaching the climate change challenge from an opportunity and equity perspective can open locked doors and increase developing countries’ buy-in. The SE4ALL initiative has created a unique opportunity to support energy access in the global climate framework while, at the same time, playing an important role in mitigating climate change and cultivating energy security and stability in developing countries.

Although the SE4All initiative created strong momentum in 2012 through its promotion by UN Secretary-General Ban Ki-moon, the selection of the charismatic Kandeh Yumkella as its chair, and the World Bank’s president Kim Yun co-chairing the initiative with Ban Ki-moon, high-level political support in advocating the importance of energy access is slowly fading. This is unfortunate as equitable energy access as a means of climate justice should be continuously emphasized to support a climate consensus for 2020 at the COP 21 in Paris 2015.

4.1.1 Reforming Climate Finance to Include Energy Access

Integrating the goals of energy access with those of carbon emissions mitigation into one financing framework would help avoid a situation where achieving goals in one area occurs at the expense of another. Taking into account the synergies between energy access and climate change, the investment needs required for universal energy access, while still daunting, no longer appear insurmountable. First, the Green Climate Fund (GCF) alone provides extraordinary energy access opportunities in a climate-compatible manner, with donor states having pledged \$100 billion per year starting in 2020 for adaptation and mitigation action. Actual financial commitments to date, however, have fallen short. The OECD world, in particular the EU and the US, should make the case to constituencies that upholding pledges to climate finance – which would also enable increased access to modern energy in developing countries – is not only good for the climate, but also for economic and social development in developing countries. For their part, developing countries should be encouraged to anchor the access goal more systematically in their Nationally Appropriate Mitigation Action (NAMA), which is meant to facilitate access to global climate finance. Many NAMAs are currently under development and are supported by international facilities.

Second, the World Bank's various mechanisms offer considerable opportunities to link the objectives of climate change adaptation and mitigation with those of energy access provision. In fact, this is already taking place. For example, the Program for Scaling-Up Renewable Energy in Low Income Countries (SREP) within the Climate Investment Fund (CIF) aims to demonstrate the social, economic and environmental viability of low carbon development pathways in the energy sector by increasing energy access through renewables (World Bank 2014). The EU and the US, together with other donors, should work to ensure that new and existing climate funds follow suit.

4.2 Promote Equitable Energy Access in the Subsidy Reforms Narrative

Transparency and public awareness of the subsidy burden can be the most powerful engine for debates that go beyond energy sector fiscal issues to address adverse impacts on service quality, crowding out effects in state budgets and, last but not least, equitable energy access and the climate. A crucial first step to phase out subsidies is to support credible partner organizations that build trusted, long-term relationships with host country ministries, which enables productive engagement with their activities. However, to allow fruitful debates to happen, societies need to develop a shared understanding of energy as an economically scarce resource and the impact of unsustainable energy subsidies.

Therefore, energy and climate literacy and the idea of energy equitability must be promoted through education, the media and civil society dialogues to help gear

subsidy reforms towards long-term welfare goals. The decreasing or elimination of subsidies needs to be compensated by an improvement in public services and the deployment of a communication and dialogue strategy that builds on a credible political narrative and permanent stakeholder consultations while applying targeted measures to support the poor (GSI/IISD 2012). The provision of equitable energy access supports these requirements in a large number of countries and should be better incorporated in the political narrative that drives and justifies energy subsidy reforms.

The EU and US, together with other donor countries, should increase their engagement in and support of organizations that help national governments pave the way for such energy pricing reforms on the grounds of a sustainable consensus. While existing capacities, for example the Global Subsidies Initiative, have done excellent work and require further support, specialized and independent consulting capacities need to be developed and deployed to foster long-term relationships with host governments and develop tailored solutions that help governments steer energy pricing towards increased equitability, access and less pollution.

4.3 Improving Local Institutional Capacity and Global Steering Mechanisms

In order to enable energy access, new policy frameworks are needed that link the local level, where innovative access solutions need to be developed, with effective national support agencies and sound international support and finance. Making progress on universal energy access requires global mechanisms that reach the local level tangibly and effectively, including remote and poor urban areas. To allow such tangible results on the local level to be scaled up, institutions at the global level must streamline their strategies and financial commitments towards local empowerment and the development of local institutional capacities and innovation.

4.3.1 Growing Effective Local Institutions to Implement Energy Access

More than half of those without access to electricity can be reached more efficiently through decentralized power solutions such as mini and micro hydro power, smart photovoltaic (hybrid) mini grids and stand-alone systems, for example, solar home systems and swarm-electrification⁴ or local fee-for-service models (Biro, Brew-Hammond 2012). This, however, challenges the centralized electrification paradigm and requires the development of effective and sustainable local institutions, as decentralized approaches share the distinct feature of being out of reach from utility service models due to the fact that their operation is too costly.

4 For example, the smart interconnection of solar-home systems with interactive micro grids.

A few steps can be taken to overcome these challenges. First, local institutions need to develop sufficient absorptive capacity and approaches to engage in a professional and fair manner with a large number of rural communities or customers with proven local business models. It is essential to conceive of decentralized electrification in its various forms more as the development of a local resource system. This system needs to be developed, learned and sustained locally through a complex set of rules and technical and financial know-how and practices. Nested enterprises in the form of micro utilities, local cooperatives or local service providers have shown the best results in managing internal challenges, but require considerable support during their initial years of operation through dedicated organizations, for example rural electrification agencies.

Second, successful micro-utilities and start-ups with highly innovative energy access systems have demonstrated around the globe that they can successfully manage internal economical, operational and socio-economic challenges. However, when it comes to the scale-up and replication phases, they face considerable challenges as a result of high transaction costs and the costly capacities required to reduce financial and operational risks in the early years of operation (Flotow, Friebe 2014). National frameworks, such as licensing procedures, tariffs and standards and global support mechanisms – in particular financing – need to be designed in such a way that they allow competitive providers to attract funding and investment and grow beyond local boundaries.

Third, the development of rural electrification agencies that create suitable frameworks and support mechanisms requires an organic, long-term growth process. However, too many actors provide large amounts of funding with short program timeframes, often with unreliable or even contradicting incentives. While the World Bank and the European Union, for example, have made progress in this respect, there is still a need to shift aid programming to the fostering of local institutions that develop locally tailored, technically and economically viable access solutions, and include built-in absorptive capacities to manage national and international funding.

4.3.2 Streamlining Global Mechanisms to Steer Access Strategies

To enable energy access through more effective local institutions, there is an urgent need to streamline the numerous existing approaches at the global level and provide reliable, long-term financial incentives in energy poor areas. Doing so would encourage both the creation and fostering of such agencies as well as competition for optimal access solutions and as a result, investments in technology and smart business models. Establishing an international framework dedicated to energy access that effectively leverages access and climate finance mechanisms would be a milestone in achieving universal energy access for all.

Here, the EU and the US can and should play a major role. The European Commission plans to dedicate €465 million by 2030 for the SE4ALL initiative's goals, with additional strong commitments from its member countries. The US has also allocated large financial resources through various instruments, for example the Overseas Private Investment Corporation (OPIC), the Millennium Challenge Corporation and USAID. Together, the EU and the US already hold the required technical and financial capacity to create more reliable and comprehensive global financial frameworks to achieve the SE4ALL initiative's access goal.

Furthermore, since both are major contributors to global climate finance instruments that almost exclusively support the SE4ALL initiative's renewable and energy efficiency goals, the transatlantic partners have the opportunity and the leverage to steer this funding not only towards greenhouse gas mitigation and adaptation, but also towards the development of a more equitable energy society through increased energy access. Climate finance, through its greenhouse gas reduction monitoring, provides strong long-term incentives that allow lifetime and cost-benefit assessments of access solutions. Moreover, it would provide a reliable, long-term financial support framework that includes clear-cut criteria to incentivize sustainable and cost-efficient electrification, reduce risks and enable targeted technical assistance at the national level.

The SE4ALL initiative should be utilized as an umbrella governance mechanism to streamline access finance away from the fragmented programming of multiple institutions and financial mechanisms towards a more coordinated framework. This would not only increase efficiencies and reduce transaction costs, but also provide developing countries more coherent and consistent financial incentives. Existing institutions and mechanisms such as the IEA, the International Renewable Energy Agency (IRENA) and the UNFCCC, together with international development actors such as the World Bank and the OECD-DAC, among others, must play an important role both in designing the overarching mechanisms to guide these processes as well as implementing these policies on the ground.

4.4 More Research to Better Understand the Effects of Black Carbon

Findings on black carbon presented by the US Environmental Protection Agency (EPA) in 2012 showed that currently available scientific and technical information provides a strong foundation to achieve lasting benefits for public health, the environment and the climate by reducing black carbon emissions mainly in Asia, Latin America and Africa (EPA 2012). However, adequate responses to these findings are lacking and current mitigation strategies will not be sufficient to transform black carbon-intensive energy consumption patterns. In order to strengthen the case for linking the goals of energy access and climate change, more research is needed on how black carbon emissions can be reduced by meeting universal access goals through modern energy sources.

5 Conclusion

The European Union, its member states and the United States, as the world's largest donors of both climate finance and development assistance, hold considerable power in defining priorities with respect to global public policy. If any progress is going to be made in mitigating global carbon emissions while at the same time enabling universal access to modern forms of energy, the transatlantic partners must throw their collective weight behind the promotion of a more holistic global framework that links climate finance, energy access and subsidy reform. This would represent not only a better strategy towards overcoming the global climate change negotiations impasse with many developing and least developed countries, but also a more cost-efficient transatlantic approach to the challenges of energy and climate justice.

To make this happen, more effective international governance mechanisms can be fostered to steer efforts to achieve universal energy access. In this respect, the EU, the US and other supporters could elevate the SE4All initiative to serve as a global steering mechanism to address the challenges of more equitable energy access. The initiative can, first, serve to integrate the strengths of existing institutional actors while avoiding the inefficient duplication of, and competition among, varying implementation strategies at the local level. Second, act a hub for technical and financial support, together with other relevant institutional actors and mechanisms, for developing countries to improve local institutional capacities to successfully scale up energy access activities.

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