

Making Climate Change Mitigation More Meaningful

The link to universal energy access



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The global energy system is the single largest contributor to climate change, and reducing energy consumption and greenhouse gas emissions from energy is of paramount global importance to avoid catastrophic climate change. But increasing access to modern energy services for the 1.2 billion people who have none is a global imperative as well. Access to energy increases incomes, improves health, healthcare, education, and security, and reduces labour-intensive practices of all kinds. This paper emphasizes the fundamental importance of including both issues in climate planning and provides recommendations on how decision-makers and institutions can quickly and effectively address both issues simultaneously.



Executive summary

Energy access is not a climate issue in terms of greenhouse gas emissions. The International Energy Agency's (IEA) newest projections indicate that radically ramping up access to modern energy services in sub-Saharan Africa, home to half of the world's 1.2 billion energy-poor people, would only increase global greenhouse gas emissions by 1 per cent in 2040.

The looming threat of anthropogenic climate change has understandably created a growing push for low-carbon green growth in recent years, and as a result 95 developing and emerging economies now have renewable energy support policies – up from only 15 in 2005. While these policies are welcome and necessary, for the most part they have been designed and informed by stakeholders and energy experts who are not in the business of delivering energy to the poor. Most of these planning processes focus on megawatts and grid connections, which is attractive to policymakers and donors because they are easy to count and use to illustrate 'progress'. But to the energy poor these are unhelpful and irrelevant metrics, because more often than not new megawatts go to industry and the easy-to-reach, and the few connections that are made to energy-poor households mostly offer very unreliable service.

If the global energy access agenda is not more robustly paired with the climate agenda, the energy poor will remain what they have always been: left behind. Empirical evidence from Bangladesh, Bolivia, and Rwanda shows capable manpower in the energy access space to be extremely limited. Meaningful and sustainable approaches to energy access remain largely unfamiliar to most actors in the energy sector, and the only way to deliver on them is to radically and urgently ramp up broad-based capacity building on decentralized approaches to energy service provision amongst practitioners, policymakers and the finance community.

Traditional, donor-driven 'technical assistance' cannot deliver the results required: a new, broad base of energy professionals and educators must be created to prime the pump to expand the energy-access sector. This workforce would promote a revolution in mitigation dialogue – one that focuses on the decentralized, citizen-(em)powered, community-based mitigation needed to solve the interrelated climate, cooking, and broader energy-poverty crises.

The tools and technologies to begin this revolution are already available but must be mainstreamed into the climate-smart energy discourse and training associated with it. There are numerous global, regional, and national-level organizations that are well placed to begin broad-based, climate-smart, decentralized, energy-access financing and education schemes. The paper closes by making substantive recommendations to multi-lateral development banks, regional economic and trade blocs, Sustainable Energy for All (SE4ALL), the United Nations Framework Convention on Climate Change (UNFCCC), donor countries, and developing country governments on how to quickly and effectively begin delivering on global climate and energy-access objectives simultaneously.

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Universalizing energy access is not a climate issue

As global development agendas increasingly recognize energy access and energy poverty as the linchpin issues that they are, it is important to clarify their place within the most important socio-ecological issue of our time: climate change.

The global energy system is responsible for approximately 60 per cent of global greenhouse gas (GHG) emissions (IPCC, 2011). But increasing access to modern energy services for the 1.2 billion people who currently lack them completely can increase incomes, improve health, healthcare, education, and security, and reduce labour-intensive practices of all kinds. But at what cost will these improved lives and livelihoods come to the fight against global climate change?

Of the world's 1.2 billion people living without access to any modern energy services, over 620 million live in sub-Saharan Africa, where between 1900 and 2012 only 1.8 per cent of global GHG emissions were generated (or only 0.6 per cent if one excludes South Africa (IEA, 2014)). In India, where about 400 million people still lack access to modern energy services, household electricity was expanded by about 50 per cent between 1981 and 2011 to reach over 650 million additional people. This massive increase in access was only responsible for 3-4 per cent of India's carbon dioxide emissions, or about 50 million tonnes (Pachauri, 2014).

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Looking forward, under the International Energy Agency (IEA)'s 'New Policies' scenario, which assumes progressive policies and enhanced investment to alleviate energy poverty, access increases dramatically but is still not universal (due largely to rapid population growth). In this scenario, sub-Saharan Africa's contribution to global GHG emissions in 2040 would still be only 3 per cent, with per capita emissions only 15 per cent of the global average. GHG emission increases in the region related to energy access would only account for 1 per cent of increased global GHG emissions over this time (IEA, 2014).

There is debate over whether these figures underestimate future energy use because they assume lower levels of energy consumption than *should* be made available to the poor (Bazilian and Pielke, 2013), or are *predicted* to be used as people buy and use appliances as poverty reduces (Wolfram et al, 2012). However, even if there is some under-estimation, the balance is still firmly towards the argument that energy access is not a climate issue, particularly given its importance to global human development.

Why universal energy access does matter for the climate

Despite the small overall impact that universalizing access to modern energy services will have on climate change, because of the prioritization of energy and sustainable development within global climate discussions and institutions, it is imperative that energy access be placed much higher on the climate agenda than it currently is for three important reasons.

1. Energy planning is very often anti-poor

Business-as-usual energy planning is often anti-poor, and there is a risk that low-carbon planning will turn out to be the same.

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The looming threat of anthropogenic climate change has, understandably, created a growing push for low-carbon green growth. Global and international institutions have adopted global and regional green-growth strategies and initiatives, and the treaty-based Global Green Growth Institute (GGGI) was established to promote these strategies.

These efforts have led to at least ten, often overlapping, green/climate energy evaluation and planning processes, which are now underway at national levels. Under the auspices of the UNFCCC these processes include Technology Needs Assessments (TNAs), Nationally Appropriate Mitigation Actions (NAMAs), and National Adaptation Plans (NAPs). Under the Sustainable Energy for All (SE4ALL) initiative they include Rapid Assessments and Gaps Analyses (RAGAs), Investment Prospectuses, and Action Agendas. Under the GGGI there are green growth plans (GGPs), and under the International Renewable Energy Agency (IRENA), countries are undertaking Renewables Readiness Assessments (RRAs).

Partially as a result of these processes, 95 developing and emerging economies now have renewable energy support policies, up from only 15 in 2005 (REN21, 2014). While these policies are welcome and necessary, for the most part they have been designed and informed by stakeholders and energy experts who are *not* in the business of delivering energy to the poor. Accordingly, most do not address the primary issue that has left 1.2 billion people without access to modern energy services well into the 21st century: energy infrastructure expansion generally focuses on connecting the customers who are easiest and most profitable to serve, and improving the services of those who already have connections.

Most of these globally facilitated and mandated planning processes focus on megawatts and grid connections, which is attractive to policymakers and donors because they are easy to count and use to illustrate 'progress'. But to the energy poor they are unhelpful and irrelevant metrics, because more often than not new megawatts go to industry and the easy-to-reach, and the connections that are made to energy-poor households mostly offer a very unreliable service.

Despite this reality, grid expansion remains the 'go-to' option because it is what developers know how to develop, what regulatory authorities know how to oversee, what operators know how to operate, and, crucially, what banks know how to finance. This makes low-carbon and green-growth planning problematic in the context of energy poverty because about 84 per cent of the energy poor live in rural, sparsely populated areas (IEA, 2011), where grid extension is often neither feasible, nor affordable, nor desirable. Grid extensions are furthermore slow to deploy, prohibitively expensive, often unreliable, provide minimal long-term employment, and remain mostly dependent on fossil fuels (Baumert et al., 2005; Nouni et al., 2008; Deichmann et al., 2011).

Where energy poverty is specifically addressed in energy plans, it often lacks concrete, actionable targets. As clearly articulated by the IPCC, this is particularly problematic because 'Climate-resilient development pathways will have only marginal effects on poverty reduction, unless structural inequalities are addressed and needs for equity amongst poor and non-poor people are met.' (IPCC, 2014, p.13) The Sierra Club, illustrating the problems associated with planning from a traditional energy professional standpoint, as opposed to taking an approach that looks more at decentralized, contextually appropriate energy solutions to clean energy access, found the IEA's cost analysis of achieving universal energy access to be radically overinflated due to unrealistic assumptions of growth rates and inefficient energy delivery models (Craine et al., 2014).

The unfortunate retention of a business-as-usual approach to low-carbon planning in the energy sector that is creating friction with the global objective of alleviating energy poverty. To date, energy planners have failed to provide coherent, holistic approaches to delivering energy access, and as it stands, unless these processes are improved and undertaken in a more coordinated fashion, there is a real risk that the energy poor will remain what they have always been: left behind.

2. Improving access to clean cooking has impressive human health and climate benefits

India alone is home to a third of the 2.8 billion people who lack access to modern cooking solutions. The situation is expected to improve only slightly by 2030, even under the IEA's optimistic 'New Policies' scenario. The number of people reliant on biomass for cooking in sub-Saharan Africa is actually expected to increase by some 200 million people over the same period (Banerjee et al., 2013). In sub-Saharan Africa about 80 per cent of



Charcoal – on sale here in Kibera, Nairobi – is often unsustainable and causes respiratory disease. ©Practical Action

household energy demand is for cooking. In Organisation for Economic Co-operation and Development (OECD) countries it is only 5 per cent (IEA, 2014). Millions of poor people spend hours each day collecting wood and other biomass. Moreover, cooking with solid biomass results in over 600,000 premature deaths in Africa every year from illnesses related to indoor air pollution, and contributes heavily to deforestation (IEA, 2014).

The IEA expects demand for fuelwood in sub-Saharan Africa alone to increase dramatically from 694 million tonnes per annum in 2012 to 1,071 million tonnes in 2040, thus greatly increasing the burden on already unsustainably managed forestry stocks – stocks that have been found to sequester 16 per cent more carbon dioxide than previous models suggested (Sun et al., 2014). On top of these new findings, cooking with traditional biomass releases non-trivial amounts of methane as well as a quarter of global black-carbon emissions. Next to carbon dioxide, these are the two most important warming agents affecting global climate change (UNEP, 2011). Improving domestic biomass cooking, or switching to liquid petroleum gas for cooking (which releases approximately

Improving domestic biomass cooking is currently seen as the single greatest opportunity to reduce black carbon emissions

the same amount of carbon as biomass, but is much better from a human health and black carbon standpoint), is the single greatest opportunity to reduce black-carbon emissions (UNEP, 2011).

Despite the clear human health and environmental benefits of improving or switching away from traditional biomass cooking, it is often challenging to convince people to permanently convert to cleaner cooking fuels. It can cost more, and challenge cultural and social norms and habits connected with cooking. The profile of cooking as a global climate and health issue should be raised considerably. Interestingly, many developing countries already recognize this.

3. Energy for access and energy for climate is no longer an either/or discussion

Energy access solutions are also climate-smart. Commercial wind energy reached grid parity with coal in South Africa early in 2013 and the sector is experiencing a boom that would have been thought impossible just three years ago. Grid-scale solar is already at parity with conventional energy in Eastern Africa as well. While this is impressive, even more remarkable is that solar photovoltaics (PV) prices have fallen by 80 per cent since 2008 (IRENA, 2014), making light from an inexpensive solar lantern, the price of which has also dropped dramatically in recent years, now literally hundreds of times cheaper (measured as \$/lumen hour of light) than the default lighting source of the energy-poor, kerosene, on which they typically spend 20–25 per cent of their income.

The unreliability of the fossil-fuel powered grid in Nigeria alone results in millions of diesel generators rumbling to life every day and yet unexpected power cuts prevent businesses from functioning reliably and children from doing homework after dusk. The price of solar home systems, which could provide power for many of the applications



Options for improving the safety and sustainability of cooking take many forms. ©Practical Action

currently fuelled by dirty generators, has dropped significantly in recent years and they are now becoming competitive with generators, especially taking into account the unsubsidized cost of fuel. They are also becoming more and more relevant as super-efficient appliances such as refrigerators, water pumps and televisions are being developed to work specifically with such systems.

The new, portable, modular, and affordable pico-, micro-, and mini-energy sector has incredible potential to help prevent fossil fuel lock-in for the energy-deprived and underserved, whether it is replacing fossil fuels or providing access to modern energy services. This fact has been recognized by many governments, as illustrated in the UNFCCC's newest synthesis report of 31 TNAs completed by non-Annex I countries. Energy, and in particular, electricity generation, was the most prioritized mitigation sector, in particular small-scale, access-facilitating technologies.

The Technology Executive Committee of the UNFCCC should be commended for prioritizing decentralized energy

The Technology Executive Committee (TEC) of the UNFCCC has taken these results on board and should be commended for prioritizing decentralized energy, mini-grids, and distributed generation as suggested areas for work in its 2014–15 rolling work plan. In particular, its plans to work on globally funded Renewable Energy Feed-in Tariffs (REFITs) for distributed, community-controlled power and sustainable energy access in developing countries is something that the broader energy-access community should place much higher on its agenda. Yet, while the potential for improving access in this context is real – as was noted in the previous section – so is the likelihood that the poorest of the poor will continue to be left behind unless concerted action is taken to ensure that these tools are aimed at providing access for them.

Asking the right questions and training the right people

Before taking action, one must understand what types of action are necessary and why. Knowledge of energy systems for energy access is extremely constrained by what was, but is no longer, the reality: renewables were expensive, inefficient and often fragile; decentralized systems were complicated and often prone to breaking down; and community needs were assumed to be easily understood from the outside. As a result, as was thoroughly reviewed in the first issue of the Poor People's Energy Briefing



Villagers from Lorengippi, in Kenya's Turkana County, helping to build solar water pumps for irrigation and clean water for drinking. Credit: Andrew Heath ©Practical Action

series (Stevens, 2014), there are massive evidence gaps. These include information about energy technologies themselves, business models, costs, and financing, questions around how mini-grids can be made more commercially viable, the role of communities and civil society, as well as reliable data on current levels of access.

Our research also identified the need to urgently rectify the massive capacity and skills shortages on energy access, an issue also broached in the development of Practical Action's Energy Access Ecosystem Index. Empirical case studies of Bangladesh, Bolivia, and Rwanda undertaken using the Index found capable manpower in the energy access space to be extremely limited (Practical Action, 2013). Indeed, in many energy-poor countries there are no, or only very limited options in very specific locations, for technical, vocational, or academic training in decentralized energy systems.

Global industrial interest in decentralized energy for energy poverty alleviation, although growing, remains marginal. And governments, both policymakers and regulators, are often completely unaware that technology has matured to make decentralized energy generation a viable and often superior option for improving access to modern energy services to the energy poor. If they are aware of these realities, policymakers often don't know how to devise supportive frameworks to encourage their deployment. Given this state of affairs, it should be clear that it is not the traditional donor-driven 'technical assistance' with energy access that is required, but rather the creation of a new, broad base of energy professionals and educators to prime the pump for the expansion of the energy access sector.

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There are two reasons to urgently support the establishment of vocational, business, and civil society training, university departments, financial institutions and political and regulatory support for climate-smart energy access. First, there is a moral imperative. A crucial component of a holistic understanding of sustainability is the idea of technology justice: all people have the right to access the technologies they need to live the lives they value, provided this does not prevent others, now or in the future, from doing the same. Modern energy services and the technologies through which they are provided are catalysts and enablers of opportunities to live fuller, safer, less laborious, and less precarious lives. Because global development aims cannot be met by a handful of practitioners spread thinly across the globe, there is a moral imperative to put significant resources into educating and training energy access professionals to foster access to such life-changing opportunities.

Second, we cannot avoid catastrophic climate change without expanding this sector. The education and skills necessary to improve energy access overlap significantly with those needed to deploy both hard and soft climate mitigation technologies more broadly. Developed countries have committed to mobilize US\$100 billion per annum in climate finance by 2020, much of it to be spent on the 'energy revolution' that has been called for to avoid global temperature rise of more than 2 degrees celsius. With the lack of a meaningful educational or technical base, or an enabling environment for climate-smart, access-focused energy expansion in the vast majority of energy-poor countries, it is not conceivable that even a fraction of this money could realistically be deployed. Therefore donors must urgently support the creation of climate- and access-smart energy training and educational opportunities in all countries, and furthermore must incentivize global energy professionals to educate themselves, and others, about climate-friendly and decentralized energy options.

Creating local skills bases, including women and youth, for work on climate mitigation technologies, and energy technologies in particular, will have immediate positive spill-over effects as there is already a huge demand for trained energy professionals in many countries. The presence of a competent workforce (and educated regulatory and policymaking bodies) lowers investors' perceptions of risk, and increases investment and job opportunities (the UNFCCC's newest TNA synthesis report notes that countries' self-identified inadequate standards, codes and certification are the primary technical barriers to transfer of climate mitigation technologies (UNFCCC, 2014)).

Fostering community-based mitigation

While universalizing energy access may not do much to immediately affect carbon emissions (and it is squarely the responsibility of those who currently and historically have emitted most to radically reduce their emissions), addressing the cooking crisis will have important impacts on black carbon emissions, and enabling access using modern, clean technologies will set communities up to leapfrog the fossil-fuelled western development model. These will have important positive consequences in the long term, and it is the global community's responsibility to foster progress on this front.

Approaches to Community-Based Adaptation (CBA) went from being niche ideas promoted by a small cadre of key intellectuals and practitioners in the early 2000s to a major driver of the current climate adaptation discourse. A similar revolution in discussions about mitigation is needed – decentralized, citizen (em)powered community-based mitigation is needed to solve the interrelated climate, cooking, and broader energy poverty crises – and particularly to ensure low-carbon strategies also work to deliver on energy poverty.

Practical Action has developed a suite of frameworks for such an approach in our Poor People's Energy Outlook (Practical Action, 2014), and for energy access markets together with the European Union Energy Initiative Partnership Dialogue Facility (EUEI-PDF) (EUEI-PDF, 2014a), who also recently developed an important policy tool kit to demystify regulation of mini-grids, which will be key to achieving climate-smart universal energy access (EUEI PDF, 2014b). To avoid the risk that the poor and marginalized are left behind yet again by global development efforts, these and other complementary bottom-up energy planning and delivery tools, such as that developed by CAFOD and the International Institute for Environment and Development (IIED) (2013), must be important components of the training and education described in the previous section.

Getting to work

There are numerous global, regional and national-level organizations that are well placed to begin broad-based, climate-smart, decentralized energy access financing and education schemes. The list below illustrates how a number of existing institutions can help to quickly encourage rapid progress towards universal energy access:

Multilateral development banks

The World Bank Group and regional development banks are fundamentally failing to invest in decentralized energy solutions despite the clear evidence that has existed for years from the IEA and others, that this is precisely where the majority of energy investments must be targeted (see Figure 1 below) (Sierra Club and Oil Change International, 2014). The (in)actions of these banks send important signals to governments, national-level financial institutions and businesses.

It is vital that development banks create large new windows of patient (10 or more years), subordinated, mezzanine-type debt and convertible grant instruments for decentralized energy, especially mini-grids. They must also work closely with national governments to create complimentary, national-level incentives for businesses and other organizations in this space, including civil society, which are more inclined to target their energy interventions at the poorest of the poor.

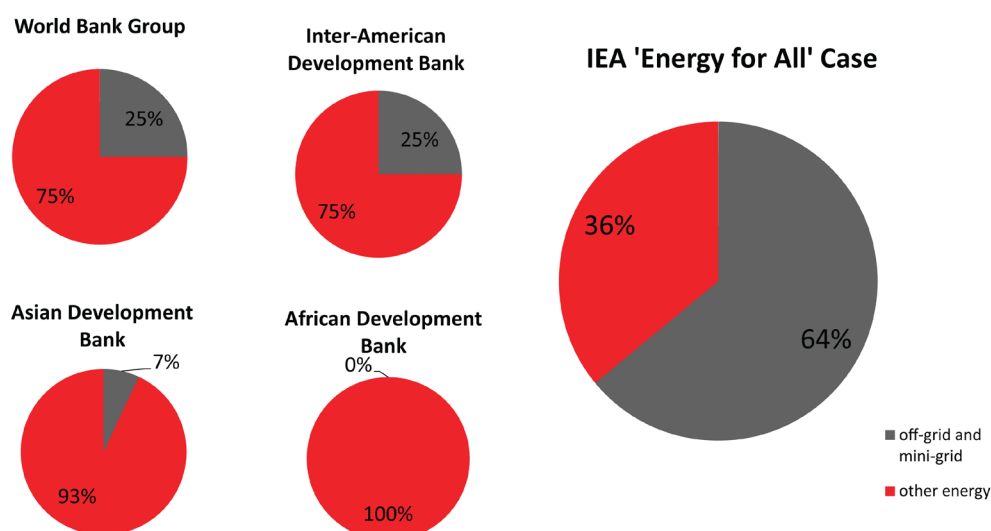


Figure 1 Off-grid and mini-grid renewable energy spending as a percentage of the annual energy access portfolio.

Globalizing IDCOL

Using donor funding, Bangladesh's Infrastructure Development Company Limited (IDCOL) is a public-private partnership that certifies and provides subsidized financing to sellers and installers of solar home systems in Bangladesh. By the end of 2013, IDCOL had facilitated the sale of over 2.6 million units, bringing basic energy services to over 12 million people, 83 per cent of whom live below the poverty line (IIED, 2014). The magnitude of IDCOL's success was both unexpected and unprecedented, and is a shining example of an institution that urgently needs to be copied by others. While IDCOL has an international team to facilitate exactly that, it is unlikely that they can be set up robustly in all the nations that need them as quickly as is needed without significantly more support. **Donors should substantially increase support for IDCOL's international replication, while simultaneously establishing regional IDCOLs in regional development banks or in regional sustainable energy centres (see next section point), which should provide IDCOL-style training, vetting and financial support for a wider variety of climate-smart, decentralized energy businesses and civil society organizations working on related issues.**

Regional economic and trade blocs

The Economic Community of West African States (ECOWAS) has had tremendous success, with the creation of the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) putting energy, and energy access, high on the agenda of its member state

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governments, and currently developing a rural electrification programme. ECREEE and its Arab counterpart, RCREEE, will soon be joined by regional centres opening in East and Southern Africa, the Caribbean and the Pacific (UNIDO, 2014). **Similar centres should be established for all remaining regional economic blocs and be scaled up to offer more regular educational opportunities and expanded advisory services to policymakers, regulators and financiers on creating supportive, enabling environments for climate-smart decentralized energy access.**

Sustainable Energy for All (SE4ALL)

This initiative of the UN Secretary-General, which 84 countries have opted into so far, has begun important processes of planning national, climate-smart, universal access to energy in a number of countries. However, so far these processes have a very poor record of including all relevant actors in the process, particularly those with a specific focus on access (Gallagher and Wykes, 2014). **SE4ALL must require that Investment Prospectuses, Gaps Analyses and Action Agendas created in its name be made public, and also have meaningfully engaged with all relevant actors, especially civil society, decentralized energy developers, and financiers, in their consultation and development.**

UNFCCC technology and financing mechanisms

The Climate Technology Centre and Network (CTCN) is positioning itself as the premiere institution and network for global capacity building on climate-smart development. **It is crucially important at this early stage in its development that the CTCN create an institutional climate that recognizes the overwhelming importance of decentralized energy approaches to achieving global climate and energy access objectives.**

The TEC has begun important work on decentralized energy, including the complex topic of mini-grids and global feed-in tariffs. Because the TEC plans to provide input to the operating entities of the Financial Mechanism of the UNFCCC (Green Climate Fund, the Global Environment Facility, and the Standing Committee on Finance), **it is imperative that the TEC plugs itself into the vibrant ongoing discussions about financing and business models within the energy access community, including by inviting experts and institutions working on these issues to work with the TEC in preparing its recommendations.**

Along with other financial institutions, **the Financial Mechanism of the UNFCCC should be encouraged to create windows of patient (10 or more years), subordinated, mezzanine debt and convertible grant instruments for decentralized energy, especially mini-grids.**

Donors, foundations and other philanthropic funding organizations

Even as the private sector moves increasingly into the energy access space, it is important to remember that, due to the profit motive of this sector, **the poorest and most remote populations will remain underserved without grant support.**

Changing how renewable energy services are perceived by policymakers, the financial sector and end-users is necessary to prepare the ground for successful legislation, implementation, and acceptance of pro-poor changes in the energy space. **Donors must focus much more money on broadening educational and training opportunities that focus on decentralized energy access, and bottom-up approaches to its delivery, including by increasing funding to those civil society organizations most experienced in such approaches.**

Lastly, organizations running funding competitions that aim to seek out the best and brightest people and businesses must co-ordinate their 'runners up pipelines'. Hundreds of projects and businesses very close to viability are passed by due to the limited number of awards in competitions. These qualified runners-up should be shared widely with other donors, business incubators, and impact investors.

Energy-poor countries

Of course national governments themselves have a tremendous responsibility to create an enabling environment for climate-smart energy access deployment. Getting policy and regulation right are of obvious importance, but a number of more controversial issues must also be addressed at the national level before meaningful progress on access can be made.

Given that many energy-poor countries are highly dependent on income from import tariffs, and that energy access technologies have traditionally been burdened by high tariffs, there is a clear trade-off between income generation and energy access in many countries. Where such high tariffs exist, **inter-ministerial discussions must urgently take place to re-design tariff structures to more evenly balance immediate tariff income with the social, ecological, and economic potential of these technologies.**

Regulators and policymakers are often reticent to approve projects that will result in higher kilowatt-hour prices than the national grid offers. Aside from the fact that grids in most energy-poor countries are heavily subsidized (resulting in subsidies to the wealthy, who are most likely to have electricity), there is the further important point that when paying US\$0.25 to charge a mobile phone at an energy kiosk, or US\$1.60 per litre of kerosene for lighting, the poorest of the poor are already paying dozens of times more per kilowatt-hour than grid prices for their energy. Providing meaningful energy access to energy-poor populations may result in charges that are higher than the grid, but still less than they currently pay for energy services. **Policymakers and regulators (and financiers) must allow for, and expect, price differentials between grid, mini-grid and off-grid energy provision in their countries.**

Regulators and policymakers in many countries refuse to make public their plans for grid expansion. These plans are also often altered with little or no forewarning in efforts to gain political favour from voters in a particular region. Such practices fundamentally disincentivize progress towards decentralized energy provision. This lack of information and unpredictability from governments makes private, NGO, and donor decision-making about where to locate long-term decentralized energy investments extremely difficult. **Government energy planning should be long term, indicate areas where decentralized energy solutions would be best placed to serve populations, and publicize this information transparently.**

The only way to deliver on both access and climate is to urgently ramp up broad-based capacity building of decentralized approaches

Conclusion

Global climate change and energy poverty are two interrelated issues at the centre of our collective healthy, safe, and prosperous future. With the energy sector being the single largest contributor to climate change globally, it is crucial that global and national planning, and action to mitigate its impacts on our future, take an approach that actively avoids business-as-usual energy planning. Decision-makers must rather emphasize access-smart clean energy planning, focusing on the decentralized technologies identified as necessary to universalize access to modern energy services.

Given that these new approaches and technologies remain largely unfamiliar to most actors in the energy sector, the only way to deliver on both access and climate is to urgently ramp up broad-based capacity building of decentralized approaches to energy service provision amongst practitioners, policymakers and the finance community – a process that can be started by acting on the recommendations made here.



A shop in Yanacancha in Peru that has benefited from micro-hydro electricity. It now has a television, lighting, and computers with internet access for community use. Credit: Ana Castañeda ©Practical Action

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This is part of a series of papers written to inform public debate on energy policy and development issues. We welcome your feedback and suggestions for collaboration. For more information, please get in touch at policy@practicalaction.org.uk

Front page photo: Community members of Patla village in the Parbat District of Nepal transporting transmission wire for their new wind energy system. © Practical Action

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