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Pro-Poor Electricity Provision

Strengthening the Poverty Impact of Renewable Electricity Investments: Summary of E-Discussion

Ana Pueyo

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The IDS programme on Strengthening Evidence-based Policy works across seven key themes. Each theme works with partner institutions to co-construct policy-relevant knowledge and engage in policy-influencing processes. This material has been developed under the Pro-Poor Electricity Provision theme.

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1 Introduction

Electrical wires in Bac Ha, Vietnam
Photographer: © United Nations by Kibae Park

On 19 and 20 March 2014 IDS convened an e-discussion on 'strengthening the poverty impact of renewable electricity investments'. The event sought to instigate a global dialogue on what is required to maximise the poverty impact of clean electricity investments, as well as inform ongoing IDS work on this topic as part of our Accountable Grant with DFID.

The rationale for holding the e-discussion now is that electricity provision has come back to the top of the list of donors' and governments' priorities after a number of years in the dark. The Sustainable Energy for All (SE4ALL) agenda is pushing for increased access to electricity and the climate finance agenda is pushing for it to be met with renewable energy sources. Numerous corporations and agencies have embraced the challenge and pledged tens of billions of dollars to achieve universal access and double the share of renewables by 2030. In addition, the United Nations Framework Convention on Climate Change 20th Conference of the Parties (UNFCCC COP-20), which will be held in Lima this year, will hopefully see parties to the UNFCCC come up with significant contributions to the Green Climate Fund, which started operations in December 2013.

This means that significant funds may be available to finance electrification projects and much of it will be for renewables. Many funders intuitively believe that electricity access can be justified in terms of poverty reduction, although they lack the robust evidence to back it up. This renewed interest in financing renewable electrification is, of course, welcome, but it could substantially benefit from the lessons learned since the 1980s. Then, many electrification programmes failed to meet poverty reduction expectations, showing instead: underinvestment in transmission and distribution; low connection rates; limited finance for productive end-use technologies and hence no impact on agriculture productivity and industrial development; and poorly designed subsidies that benefited the better off, put utilities under financial stress and jeopardised service quality and reliability.

The event was facilitated by Andrew Barnett with the support of Ana Pueyo, Theme 4 convenor. IDS provided two guidance documents: a policy brief about the evidence of poverty impacts of electricity generation capacity and a summarised policy tool to introduce poverty reduction dimensions into electrification projects.

A total of 67 participants joined the e-discussion over the course of the two days (including the facilitators). During the discussion 67 per cent of the participants posted a message, a relatively high percentage in our experience of managing e-discussions at IDS; 22 per cent contributed at least three times.

The participants came from diverse professional backgrounds, including senior managers (21 per cent), programme/project managers and coordinators (25 per cent), academics (21 per cent) and consultants and advisers (21 per cent). They represented a diversity of organisations from all across the world: government development agencies, international development organisations, international research institutions, consultancies, multilateral organisations, businesses and universities.

The e-discussion was structured around three threads:

1. How strong is the evidence that electrification has an impact on poor people, and does this matter in decisions to finance renewable generation capacity projects?
2. How can the poverty impact of renewable generation capacity projects be maximised?
3. How can poverty eradication be introduced into the Sustainable Energy for All (SE4ALL) and climate finance agendas?

This note summarises the contributions made by different participants in the e-discussion. It generalises the points most commonly raised around each thread and reflects specific points of strong consensus or contestation, but without identifying specific contributors by name. It also provides a project team reflection on how valuable the event was for our research and why.

2 Thread 1: How strong is the evidence that electrification has an impact on poor people and does this matter in decisions to finance renewable generation capacity projects?

We began discussing the evidence of benefits for poor people of electrification, particularly with renewable energy, taking as guidance the IDS report *The Evidence of Benefits for Poor People of Increased Renewable Electricity Capacity: Literature Review* (Pueyo *et al.* 2013).

There was some scepticism about the need for 'evidence' to support the cause of poverty reduction through electrification. There is already a great deal of practical experience of what works, and strong theories of change surrounding the causal chains. New evidence of impact requires robust research methodologies and is very expensive to gather as compared to anecdotal evidence. The funds required for this type of robust research on the impacts of electrification could instead be used to provide electricity to additional people.

Some participants pointed in particular to the limitations of a 'systematic review' approach, which sets very rigorous standards for the types of literature to be included. 'High quality studies' are limited to those that show an actual causal linkage between electricity and poverty reduction. To do so, they must take into account confounding factors; define an appropriate and credible comparison group (the counterfactual); choose a representative sample; carry a pre-intervention baseline survey so that differences between control and treated can be assessed; correct for potential endogeneity of the electrification variable; and justify the selection of particular specification methods. This is highly problematic in electrification projects, which are essentially 'enabling' investments. This is particularly so with on-grid electrification, where selection bias is unavoidable. Also, income-related impacts may only happen in the long term, but as time passes they are harder and harder to attribute to electricity alone. Therefore, robust studies are inevitably rare in this field.

On the other side, donors indicated the need for evidence to set the priorities of spending, where electrification competes for finite financial resources with other needs such as water sanitation, transportation, health, education, etc. Evidence, or at least a clear logic, is also required to do more of what works and less of what does not. Besides, when theories are not based in real, robust, evidence, they can be damaging. World Bank studies lacking a strong evidence base but pointing in the direction of privatisation and a market-knows-best ideological construct for the electricity sector were cited as an example.

It was recommended that we look beyond academic and robust studies to see how successful, sustainable business models are reaching the poor, how much they are costing, how much income they are generating or how much expenditure they are saving; also, to assess if success is durable or if it ends with the first showcase photos. Some of the positive experiences represented or referred to in the forum include: Acciona Microenergia in Peru, Barefoot, d.light design, Azuri technologies, BBOXX, S^3IDF, Grameen Shakti, SELCO India, ONergy, SolarAid and the Chinese grid extension programme. DFID showed a willingness to look at anecdotal evidence as a starting point to inform their policy.

Some particular areas where more evidence is required include:

- How electrification is financed presently, how it has been financed in the past, what innovations have been tried and are being tried, and what lessons for the future we can learn from those experiences.
- Impacts of on-grid electrification. Currently there is a preponderance of evidence from stand-alone projects over and above grid-based systems.
- Long-term impacts, even though with time it becomes really difficult to attribute changes to electricity.
- Evidence of integrated development programmes where energy access is designed in tandem with other infrastructure, support programmes and end-use technologies.
- Evidence of efficiency and equitability of different subsidy schemes: cross-subsidies/cash transfers (labelled or not)/upfront capital costs vs recurrent consumption costs.
- Practical examples of the ABC concept – anchor customers, business users and community members – and its role for pro-poor electrification.
- What is the most suitable electrification mode for a certain situation? Comparison of pro-poor benefits of electric and non-electric/renewable and non-renewable, on-grid and off-grid energy options in different contexts.
- Is there a trade-off between spending resources to reduce emissions and spending resources to reduce energy-poverty? Comparison of greenhouse gas (GHG) saved and energy poverty reduced between several electrification programmes/projects.

On the issue of whether or not evidence on poverty impact matters in decisions to finance electrification, some pointed to the need to distinguish different types of effect: income, humanitarian, welfare. There was the view that electricity should be considered as a basic need that does not need to prove its impact on economic growth, as is the case with clean water. Electricity not only provides light, with the potential to be used productively, but it also provides access to knowledge and the information society. It was also noted that, in the long run, evidence of financial sustainability may be more important than evidence of poverty impact *per se*.

3 Thread 2: How can the poverty impact of renewable generation capacity projects be maximised?

The general view in the discussion was that poor people should not be made to pay for a reduction in emissions. The priority in developing countries should be poverty eradication. Hence the controversy raised by IDS's focus on renewable electricity as a way to address poverty. IDS clarified that the focus on renewable energy relates to an interest in maximising/catalysing energy-related climate finance for poverty reduction.

A large number of participants considered that poverty reduction through the services provided by energy should be the priority, regardless of the energy source or carrier. Where renewable electricity is more expensive than alternative forms of supply, it could contribute to an increase in poverty. An integrated approach was proposed, which would focus on the poverty-reducing service and the best way to provide it, whether or not it was through renewable electricity. Some of the alternatives to renewable electricity that may be more scalable, quicker, cheaper and offer more sustainable pro-poor benefits in specific contexts include hybrid mini-grids, non-electrical options for productive uses, investments in the transmission and distribution network or grid intensification.

There was an agreement amongst participants that renewable electricity can be the most cost-effective solution in many contexts, mainly in remote areas and dispersed populations, or in locations with large and reliable renewable energy resources. Reliability of intermittent renewables can be strengthened in combination with storage capacity and fossil fuels. Even though the operating costs of renewables are lower than those of fossil fuel generation plants, renewable energy resources are not 'free', as is commonly stated. They may require more land, water, knowledge and capital.

A focus on energy services means that poor people not only need to gain access to sufficient and reliable amounts of electricity but they must also gain access to the end-use technologies (hand tools, mills, electric pumps and other appliances) that convert electricity into useful services. To reach the poor it is necessary to work on 'both sides of the meter', supplementing electrons with appliances, credit, knowledge and skills. Many electricity supply programmes have historically only concentrated on the supply side of the meter, therefore limiting their development impact.

There was some debate on the importance of focusing on electricity supply that allows productive uses that enable people to escape poverty rather than the provision of basic lighting needs. On the one hand, light without the possibility to generate income has a limited impact on economic development and only serves 'to shine a light on poverty'. On the other hand, more than 1.3 billion people in the world live without safe, reliable and sufficient light, which is not acceptable. Besides, the costs of LEDs and solar PV are getting cheaper and cheaper and the provision of light through pico-solar products has a high return on investment, facilitates savings on other energy costs such as kerosene and hence increases available income for the poor indirectly.

There was consensus on the following path: implementation of a large lighting programme using subsidised pico-solar PV systems to cover the basic lighting needs of all in the short term, while more ambitious electrification efforts that allow for productive uses continue in parallel.

On the issue of promoting productive uses, it was noted that this should be the field of development, not energy professionals. The preconditions of the communities to be electrified are key (i.e. access to markets for locally produced goods and services) and a number of development programmes need to be in place for the promotion of productive uses (i.e. social promotion activities in advance of electrification to create awareness of the benefits of electrification and encourage saving for the connection charge, schools, health centres and programmes to increase agricultural productivity). In addition, there should be coordination between energy and other sectoral policies at the national level. As an example, it was pointed out that in Africa, efforts to incentivise applications of renewable electricity in the agriculture sector were rendered futile by simultaneous trade policies promoting imported crops: agriculture productivity gains enabled by electricity met markets saturated with cheap imported crops and unable to take additional local production. This sort of conflict between national policies may help to explain the lack of evidence for permanent benefits from electricity for poor people. Positive impacts may only last for a short period of time before being reversed by other market-destroying policies. Mainstreaming modern energy services in all development programmes and ministries could contribute to avoiding these situations.

The transformative power of electricity through its convergence with information and communication technologies was considered as the great hope for integrating the poor into the current information society.

The financial sustainability of electricity provision was referred to as key to sustaining poverty reduction. A number of business models were suggested to achieve financial sustainability, including specific rural electrification institutions.

For off-grid solutions, scale and replicability were considered essential for financial sustainability. This means it is important to develop quality-assured standard modules/packages which facilitate franchising approaches, although local context was also cited as key to success.

The financial sustainability of electrification through grid extension requires a careful selection of the communities to electrify. To reduce political interference, it is recommended that transparent and quantifiable prioritisation criteria exist. These criteria could follow either a least-cost or a maximum-benefit approach. A least-cost approach prioritises communities according to their proximity to a tapping point, population size and density, construction costs (influenced by the terrain), peace and order condition and land rights of way. Although this approach is good for financial sustainability, for the same reason it favours the better-off. The highest benefit approach, on the other hand, favours households with the greatest need that are further from the last tapping point and provides them with subsidised renewable or hybrid technologies, hence avoiding the high cost of grid extension.

Cross-subsidisation was considered by some participants as very important to guarantee the financial sustainability and affordability of electrification programmes for remote communities. However, some participants disliked the idea of subsidising consumption and favoured instead subsidising initial connection. There was no agreement on the cost-effectiveness, financial sustainability and equitability of cross-subsidies, and it was recognised that further evidence is required on the success or failure of these schemes.

A gendered approach has not been empirically proven as more effective than a neutral approach to electrification, but women benefit greatly from the reduction in drudgery. This does not necessarily translate into more time spent in paid work. Other, non-electrical forms of energy also have many advantages for women.

Finally, participants stressed the importance of including plans for operation and maintenance in the design stage of electrification programmes in order to ensure durability.

4 Thread 3: How can poverty eradication be introduced into the SE4ALL and climate finance agendas?

Some participants noted that there are tensions between climate finance aimed at reducing GHG and that intended to increase electricity access for the poor. Climate finance should seek to maximise carbon emission reductions per unit of input, but this is not going to happen by targeting the poor, who are responsible for a negligible share of global emissions. Targeting the emerging middle classes may be more effective. Electrification for the poor should pursue the provision of energy services at the lowest cost for the poor, and renewables cannot always provide this.

Other participants pointed out that the trade-offs are not high when recent cost reductions of renewable energy technology and future cost scenarios are factored in. Setting up electrification on a sustainable pathway from the start, when consumption levels and funding needs are smaller, can deliver high benefits in the long term. However, many decision makers in financial institutions act on the belief that renewables cost more than fossil fuel alternatives and it is difficult to change their behaviour. Certainly, renewables tend to have cash flows that are more front-end loaded than fossil fuels. More research is required to ascertain whether or not there are trade-offs between inclusive growth and green growth, and under what circumstances they occur.

The failure of past climate finance to reach the poor was noted, in particular the Clean Development Mechanism (CDM), the Community Development Carbon Fund (CDCF), the Scaling Up Renewable Energy Programme (SREP) and the Climate Investment Fund of the World Bank. Failure in some cases is attributable to the low levels of expenditure to date. This situation could be reversed if parties to the UNFCCC honour their commitment to raise $100bn new money per year. The mechanisms to achieve this will be agreed at the Paris COP next year and the commitments will be further clarified in the Lima COP this year. In some other cases, like the CDM, transaction costs to get projects registered and carbon credits issued were too large for small projects until Programmes of Activities were introduced, and have stayed high even then. As a result, there has been a bias towards large-scale projects. Some kind of bundling mechanism to reduce transaction costs, or scalable, replicable solutions as mentioned in the previous thread, should be promoted to avoid this. Another problem of the CDM is the volatility of carbon prices, which has left investors at the margin at the mercy of an uncertain carbon market.

A deliberate pro-poor policy is essential to change the status quo and there is genuine interest in pro-poor electrification amongst people putting together climate funds. The focus on poverty reduction by these funds is reinforced by developed countries' wanting to make climate finance count as Overseas Development Aid (ODA) and because at least 50 per cent of the funds should be addressed to adaptation over time (even though mitigation has captured most resources to date). Electricity can help communities cope with the effects of a changing climate. Now, while climate funds are in their infancy, is a good moment to influence their principles before they are set in a particular direction. Besides, a focus on wider sections of society beyond the poorest could provide the income generation needed to help the poor.

Some recommendations for financial instruments for inclusive electricity:

- Keep it simple: eliminate intermediaries between source and recipient, create standard metrics for requests for finance instead of making each applicant repeat the same calculations.
- Use soft money to leverage more reluctant capital.
- Support the creation of sufficient bankable deals.
- Use grant finance and concessionary finance to leverage private finance and crowd funding.
- Adapt the type of finance to purpose: finance for lighting is different to finance for productive uses.

5 Next steps

The aim of our research programme on pro-poor electricity provision is to make available evidence-based policy and programme guidance for improving the design of [low carbon] energy investments so that poor people, especially women and girls, benefit from enhanced electricity access. We aim to influence the design of climate funds and the decision making of financial institutions involved in electrification to maximise their impact on the poor. Following this premise, we have developed a policy tool for the maximisation of benefits for the poor of investments in renewable electricity. This is based on a thorough review of the literature on the evidence of benefits for poor people of increased renewable electricity capacity.

This e-discussion has been useful to help IDS to focus our next research activities on what practitioners find most relevant, while keeping the consistency of our research programme. The list of issues raised is long and exciting, but our resources are limited. During the next year we seek to influence the climate finance agenda by addressing the following issues:

- What are the actual trade-offs between electrification for the poor and electrification with renewable energy? How do they change in different contexts and time scenarios?
- What is the poverty reduction potential of climate finance for electrification? How can it be increased?

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Brighton BN1 9RE

T +44 (0)1273 606261
F +44 (0)1273 621202
E ids@ids.ac.uk
www.ids.ac.uk