

# TCW Research Briefing

## Sustainable Energy for International Development

The Access to Affordable Sustainable Energy programme in India is The Converting World's initiative to address the issue of energy access for human development. The programme aims to help some of the most marginalised people to lift themselves out of poverty, whilst preventing environmental damage.

In order to understand the appropriate methods to implement sustainable energy projects for development, The Converting World is collaborating with the University of Bristol on a doctoral engineering research programme. Brad Doswell, who has a background in renewable energy engineering and environmental consultancy, is carrying out the research for his PhD. Recent achievements include the installation of a 4kW solar PV system at an orphanage in Mumbai. The system allows lighting crucial for the resident girls to study after dark.

### What is Energy Access?

According to the International Energy Agency, in 2010 an estimated 1.3 billion people globally were without access to electricity. Furthermore, 2.6 billion people remained reliant on traditional wood biofuel for cooking. The majority of these people are located within developing Asia and Sub-Saharan Africa, where 85% reside in rural locations. Despite significant efforts over the last fifty years, under current policy scenarios the lack of energy access is projected to remain widespread in Developing Asia and Sub-Saharan Africa. 1 billion people are predicted to still lack access to electricity by 2030

There is no academic or professional consensus on what energy access means. A review of literature and practice shows that definitions of energy access are commonly location specific, involve various different factors, and are subject to future change. They relate to energy services (end-uses) and the associated energy carriers (types of generation and supply), along with thresholds of basic needs.

Much practice has involved trying to establish a general level or threshold of need that applies to all developing populations. However, it is recognised now that transferable

practice must be focused on methods and frameworks to establish basic (and future) needs in an effective way for each given context.



### Energy Access & Human Development

There is a significant consensus that energy access is a prerequisite for human development. Two decades of work has established energy access as an enabler for the improvement of living standards by providing the means for various services and end uses. These include lighting; pumping and filtering water; refrigeration; cooking and heating; and ventilation.

Other benefits include the increased access to communication and information access through technology such as radio, television and mobile phones. Energy access also enables productive economical activity, such as powering small

scale industry. It also reduces the labour time required for non-income generating tasks like collecting wood fuel. Direct health improvements for women and children are also evident from the reduction in use of traditional wood fuels for cooking, by cutting exposure to harmful particulate matter released on combustion.

The causal mechanisms that underlie the links between development and energy access are now widely recognised as location specific, relating to institutional, technological, financial, political, socio-economic and regulatory factors. It is evident from the latest academic research that the focus must be to develop transferable methods to establish the causal dynamics at play between energy access and poverty in a given location, in order to design the most effective solution.

Global Greenhouse Gas Emissions would only rise by 1.3% if all basic energy access for development needs were provided by fossil fuels (Yadoo, 2012)

### Energy Access, Climate Change & Sustainability

## CONNECTED

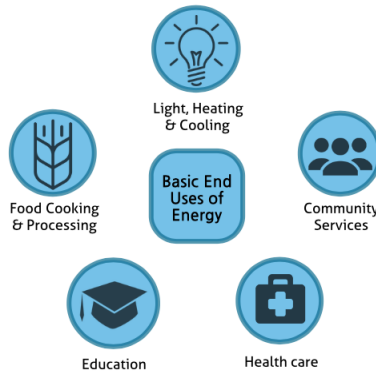
Although reducing poverty while also reducing environmental impact may seem like a natural fit, there are issues of equity (is it fair for developing populations to mitigate, with often expensive technology, continuing emissions from more affluent nations) at play.

Additionally calculations from the IEA conclude that if universal energy access was achieved (according to their definition), global greenhouse gas emissions would only rise by around 1.3% if all provided by fossil fuel sources.

The prices of renewable energy are dropping to now become competitive with fossil fuel alternatives, which means that they now are more likely to represent financially sustainable options.

According to literature and practice, it is now understood and accepted that when providing energy access for development, dimensions of sustainability identifiable to beneficiaries (namely financial & social) should be prioritised before others. Only this way can real win-win scenarios between development and ecological impact be achieved.

Financial and socio-cultural sustainability must be prioritised, as only when these are achieved can environmental benefits be realised too



### Energy Delivery Models

There is no formal agreement on what the definition of an energy delivery model is, however most attempts to define it include the same components:

- Enabling environment
- Socio-cultural context
- Technology and value proposition choice
- Implementation model

Approaches to delivery models are context specific and require techniques to help stakeholder negotiation and consensus building, development of partnerships and institutional support, establishing the socio-cultural context through community engagement, and developing acceptable value propositions (operational models).

Each part of the energy delivery model can be assessed in terms of sustainability for assessment and planning purposes. This should incorporate all dimensions of sustainability:

- Social Ethical
- Environmental
- Organisational
- Technological
- Economical

The selection of a particular preference for a value proposition and business model is based around the purpose of why it is being developed. For example this may include human development alone, or for instance, environmental conservation too.

There are many choices to make for the primary actor(s) behind an energy access intervention in terms of the scale (off-grid, mini-grid, on-grid) of the system, and all other elements of the delivery model. This will primarily depend on how they view success/effectiveness, and how other stakeholders, including end-users do too. This must be established and agreed at the outset.

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