DfID's Energy & Economic Growth (EEG) applied research programme

Critical aspects associated with the introduction and scale-up of energy innovation in developing countries

This note seeks ERP members' views on a potential research topic for EEG, namely identification of critical systemic issues associated with the successful introduction and scale-up of energy innovations in developing countries.   The preliminary thinking is based upon discussions between the EEG, the Energy Systems Catapult, and the ERP Analysis Team. We welcome ERP members' comments on:

- the scope and further detail that could be added;
- how ERP might contribute views during the project;
- whether any ERP members might be interested in contributing to the project in more detail.

Background

Investment in energy infrastructure in developing countries is often hindered by lack of evidence in the cost-effectiveness, investment return and trade-offs associated with various infrastructure deployment choices. While National as well as local area energy planning tools and capability exist, both in the UK and overseas, it is unclear to what extent the currently available tools meet the needs of decision makers in developing countries at various points through the project life cycle, from initial concept screening through to detailed design.

Even if the requisite tools exist or can be developed, achieving economic growth through the successful financing, deployment and scale-up of the energy infrastructure involves a complex interplay between end users, technology, commercial models and the surrounding market regulatory and policy structures. Innovating successfully to change the lives of the world's poorest people therefore requires an effective "institutional architecture" across public and private sectors to be in place to optimise the impact of aid investment in energy interventions.

Potential avenues of research

Through a series of case studies and interviews, the outline requirements for software tools allowing faster or more effective energy infrastructure investment choices by local decision makers in developing countries will be collated. An assessment will be made about whether these requirements are common to all developing countries or whether certain requirements are common to specific "country types." The assessment will also define at what stage in the project life cycle that these models would best be utilised. The range of national and local energy system models available currently will, where practicable, be screened against requirements to identify which models are best placed to be used with developing countries and where gaps exist in current modelling capability. DFID is running a parallel programme to the EEG where energy design will likely be undertaken in Zambia, in addition to other countries. This could be an opportunity to validate the requirements for modelling software as well as creating an evidence base for how well existing (or new) software meets end user's needs.

The second strand of potential research in the next stage of the EEG Programme is to review and summarise the various social, technical, financial, market and institutional challenges, as well as best practice, associated with energy infrastructure deployment and scaling in developing countries to drive economic growth. While the identification of challenges in deployment and scale-up creates the potential for innovators to propose and supply new solutions, thus accelerating improvement in

economic impact, the main focus and output from the research will be the proposal of optimal "institutional architecture" approaches in enabling successful scale-up. An assessment will be made about whether this normative approach is applicable across all developing countries or whether different implementation approaches are required in differing "country types," which can be segmented by certain specific characteristics. DFIDs parallel work in Zambia, and other countries, may again prove a helpful exemplar to test against any implementation approaches and segmentation proposed.