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Energy: Mini-grid electrification in Sierra Leone

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ICED developed a business case for mini-grid electrification in remote communities in Sierra Leone using innovative private-sector business models

Sierra Leone remains one of the poorest countries in Africa, with less than 10% of a population of 7 million having access to electricity. Without modern energy services, a large proportion of the population can't take advantage of the scarce education, health and economic opportunities available to them.

ICED has supported DFID to develop a business case for a £34.5 million programme to deliver electricity to the most isolated rural communities in Sierra Leone. By the end of the project, 80 environmentally and economically sustainable mini-grid systems will have been deployed in remote villages and 90 solar photovoltaics installed in community health clinics.

Mini-grids involve small-scale electricity generation (10 kW to 10 MW) that serve remote communities *via* a distribution grid that can operate in isolation from the national grid. Mini-grids represent the optimal solution for countries with limited energy infrastructure such as Sierra Leone because:

- **Rural communities don't have to wait** decades for national grid extensions to reach their areas;
- **Locally abundant renewable energy sources (e.g. solar) can be utilised** to generate electricity, minimising carbon emissions;
- **Hybrid mini-grids** (e.g. a combination of solar energy and diesel generators) can cover variable electricity demand, improving the reliability of the system;
- **Mini-grids can be installed quickly and rapidly scaled up** through a flexible modular design.

- **Mini-grids, in particular hybrids, can offer a cost-competitive solution** to meet rural electricity demand as technology innovation and market maturity continue to lead to sustained cost-reductions.

This project represents an exciting opportunity to pilot three private-sector driven business models[1] in order to refine the delivery approach and maximise benefits to the rural economy. Private-sector delivery models have been shown to encourage customer-centric and cost-effective management among local companies, incentivise decentralised decision-making processes, and provide local jobs. It is hoped that lessons learnt from this programme in design and delivery with the private sector will have wider application for other countries interested in mini-grid electrification.

In addition to 360,000 people gaining access to electricity, it is hoped that the project will foster new businesses and attract investment that will help ensure the financial viability and long-term sustainability of mini-grids in rural Sierra Leone.

The ICED energy team can mobilise a diverse range of technical experts to provide support to DFID Country Offices in conducting scoping studies, preparing business cases, developing analytical tools, and delivering tailored knowledge and learning services. If you would like ICED support or to know more about how we can help you, please get in touch with us at connect@icedfacility.org.

[1] Business model A: “Split of Assets” Model (SoA); Business model B: “Finance, Build and Lease” (FBL); Business model C: “Develop, Tender and Finance” (DTF).