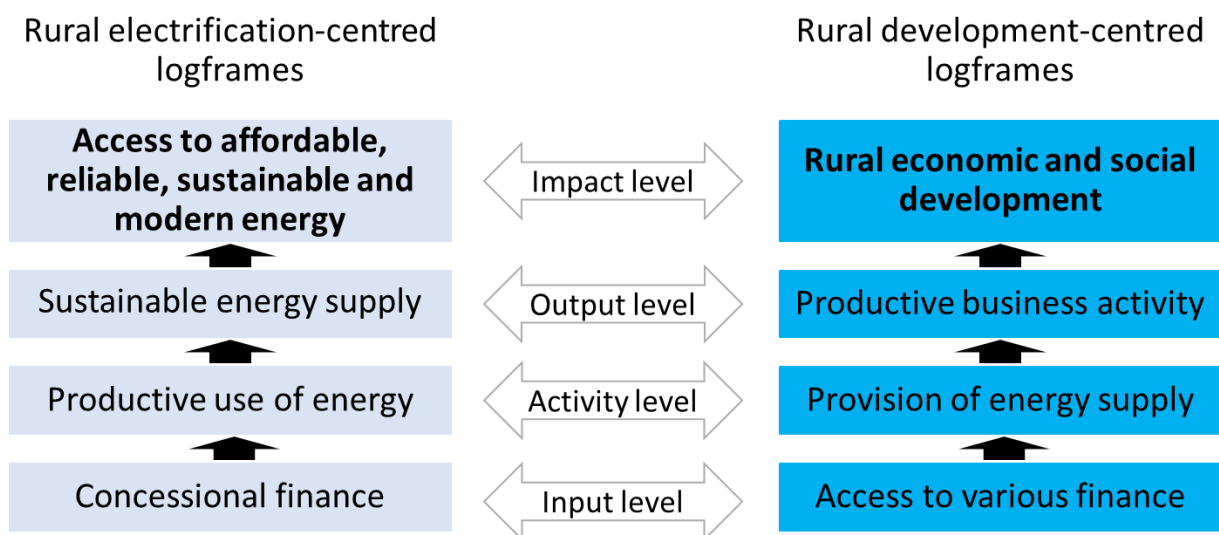


Five shifts in thinking about off-grid productive use

Subsidies, economies of scale and regulations alone are not enough to build a sustainable mini-grid market. Productive use of energy (PUE), or simply, economic activity in mini-grid villages, is paramount to a project's, indeed to a market's, success. This is a topic we have analysed at [GET.transform](#) closely this year, and are now preparing a stakeholder dialogue on. Ahead of the series and [associated paper's](#) launch, we share five of the significant recent shifts we were able to observe.

1. PUE underscores the viability of rural electrification, *or does it?*

In the past, rural electrification practitioners often linked PUE to the viability of the electricity distribution business model: by 'growing the load', the viable operation of the power supply business can be supported. **In terms of the project strategy, there was a common practice of viewing sustainable electrification as an objective at the top of the logframe, and PUE promotion measures as supporting inputs to enhance sustainability. But in reality, economic activity should be viewed as the objective of electrification.** PUE is more or less industry jargon for economic activity, so if we are to view rural electrification from an holistic angle, PUE *promotion measures*, like access to hardware and finance, should be visualized at the same level as mini-grid financing instruments. They strengthen the local economy in the same vein as electricity supply is envisaged to do so, as a form of value addition.



2. PUE interventions must focus on the local agricultural value chains, *right?*

PUE promoters tend to place strong focus on local agricultural opportunities and the tools and machinery needed to refine them. However, due to their geographical location and market position, African rural producers (read: mini-grid customers!) still struggle to unlock demand for their produce,

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even after processing. This situation is exacerbated when mini-grid projects are implemented in a large number of villages in the same district, and competitive advantages dissolve. If these producers cannot get their value-added product to a larger market where it can be sold, then an investment into value-addition is entirely unviable. From a value chain perspective, **it is more important to address the level of demand and market linkage than to focus on value addition** to the product. The need for cross-sectoral approaches, where electrification programmes are better linked to agriculture, finance, trade and other strategies, seems to be finding its way onto policymakers' agendas.

3. Selling hardware in rural Africa is not a viable business model, so we thought!

Upon visiting a mini-grid village in Africa, we struggle to find shops in the vicinity that supply electronic (PUE) equipment and/or appliances which leads us to ask: where would a customer buy a tool or adapt old inefficient machinery? Encouragingly, fourteen of the interviewees in our study reported either a primary function or a secondary stream of their business focusing on the supply of hardware to end-users. This PUE business model has emerged as the number of mini-grid projects within a portfolio has slowly begun to increase, as well as through interfacing with grid expansion programmes, where the same market gap for tools, appliances, machines and electronics exists. **The hardware supplier model is becoming more viable provided enough villages with demand for PUE equipment can be identified, and the aspect of affordability can be addressed through suitable financing instruments.** We observed some mini-grid companies supplying hardware in their villages of operation themselves, to stimulate demand for their power and create impact from electrification, but the explicit focus on PUE by some new hardware suppliers is particularly exciting.

4. The cost of PUE equipment is prohibitive for the potential users, or is it?

One barrier to the uptake of PUE found in almost all PUE studies in the African context is that most of the PUE equipment is relatively expensive from the perspective of the targeted *end-users*. Solar pumping and irrigation, mills, cooling equipment and even many of the power tools and appliances used in the services sector range from several hundred to several thousand USD. Hardware suppliers are discovering that the utilization of such equipment is far too low to justify such investments by farmers. Some of the PUE equipment, which has been considered a viable investment in terms of its payback period, has later been found to be underutilized at the farmer or village level. For example, a powered threshing machine can process a smallholder farmer's entire season crop in just an hour. The shift in thinking is that indeed **PUE equipment is often too expensive for farmers and village-level actors, but not for an entrepreneur who can utilize the equipment for several farmers each day.**

5. Farmers organize themselves in cooperatives for larger investments, don't they?

To address the above challenges, rural electrification and agriculture programmes have regularly worked with cooperatives (both agricultural and financial) to facilitate larger investments in processing equipment and tackle the utilization factor. Results have been mixed and commercial lenders in particular have shown limited interest in providing debt to such entities. At this point, another important actor enters the space between the hardware supplier and the agricultural producer, namely the service

provider. In various African markets, **we see farmers and traders making use of a growing number of services in the same manner that they are used to conducting their milling or transport:** outsourcing. Refrigeration is one such service that has become viable with off-grid electrification, and we are seeing both mini-grid companies and dedicated off-grid (solar) refrigeration service providers achieve bankable models and attract commercial investment to run these systems. With the preceding points in mind, we should be able to identify further PUE services opportunities, regardless of whether the equipment is affordable for a rural farming community, so long as there is sufficient supply of raw material and demand for processed goods.

Ashley Wearne, GET.transform Africa Lead

A trade policy analyst by training, Ashley turned to energy policy and rural electrification with GIZ in Uganda around 2012. There, the government and private sector were trialing solar-powered mini-grids in an effort to electrify an enormous rural population. Through work with international developers, energy sector transformation experts and African regulators, Ashley and team pieced together an approach for off-grid electrification which leverages maximum private sector investment, strong government buy-in and a host of cutting edge technologies to reduce the cost of electrifying the poor rural communities and promoting economic development through productive use of energy. This became the first multi-site government-solicited mini-grid programme with integrated licensing and RBF in Africa, recently launched with the first lot of 25 villages in Northern Uganda. Using these concepts developed in Uganda and others, Ashley now works with [GET.transform](#), a European donor platform which supports governments with the regulatory, legal, financial and technical challenges for public-private infrastructure partnerships.