

Appliance Demand

INSIGHT: Responding to demand for appliances will stimulate revenue growth for mini-grid operators.

Mini-grid electricity consumption among rural customers in Myanmar is in some cases lower than what is required for a viable mini-grid, as low consumption results in low revenues. With the goal of finding ways to create profitable, sustainable mini-grid business models, Smart Power Myanmar is promoting the development of scalable approaches through various demand stimulation efforts that increase consumption and increase mini-grid utilization.

Working in 8 villages served by 3 developers under the mini-grid program managed by the Myanmar Government’s Department of Rural Development (DRD), Smart Power Myanmar conducted surveys to better understand the behavioral choices around the demand for home appliances and the impact of appliance use on electricity consumption for input into the innovative Applied Energy Lab.¹

Surveying 406 households between February and August 2019, we observed the following:

- **Within the first year of mini-grid operations, 69% of the sampled households had purchased at least one appliance**, although this varied by region. Households in the coastal villages in the Tanintharyi region in Southern Myanmar had more appliances than the households in the Dry Zone in Central Myanmar: 90% of households in Tanintharyi had at least 1 appliance compared to 43% in the Dry Zone.
- **TVs were the most popular.** Among all households with appliances, 85% owned a TV, followed by rice cookers (28%), irons (25%), and fans (23%). Refrigerators/Freezers were only owned by 8% of households.

FIGURE 1: Proportion of all households in region by number of appliances owned

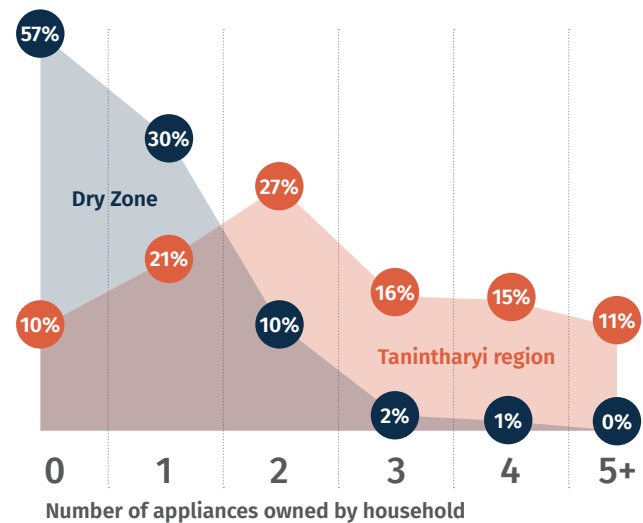
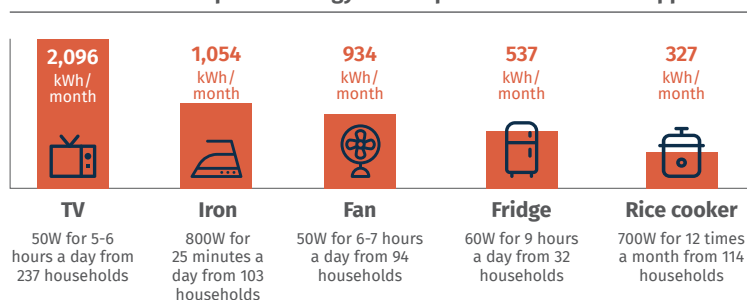


FIGURE 2: Proportion of households with types of appliances

	TV	Rice cooker	Iron	Fan	Sky	Fridge	Water Pump	Kettle
Among 173 households owning 1-2 appliances	77%	20%	8%	16%	14%	4%	4%	2%
Among 80 households owning 3-4 appliances	96%	65%	79%	53%	39%	14%	4%	13%
Among 27 households owning 5+ appliances	100%	100%	96%	93%	59%	52%	30%	11%

1. Smart Power Myanmar, Nov 2019. Demand Report: Applied Energy Lab report covering the period October 2018 – August 2019.

- **Currently, 42% of the consumption from these five most frequent home appliances is attributable to TVs.** Although the power required for these TVs averages only 50 Watts per hour, consumption rates indicate that they are used frequently and comprise the largest consumption rate among the most popular home appliances.

FIGURE 3: Relative Impact of energy consumption of five common appliances

INSIGHTS & FUTURE IMPLICATIONS

With this early data from a small number of communities, we have gained the following insights:

1 Myanmar communities served by new solar-hybrid mini-grids are at an early stage of appliance usage, yet demand can grow. While it was encouraging to see interest in home appliances, it was clear that in 7 of the 8 communities, little has been done to provide access to appliances. Households have opportunities to benefit from electricity access

beyond owning TVs, and our experience suggests that with a more diverse menu of appliance options and information, coupled with guidance to consumers for understanding how appliances impact their monthly electricity bills, demand for appliances will grow and will help to create viable mini-grids.

2 Offering financing for consumer appliances could help unlock demand from rural customers for electricity, increasing revenue for developers. Financial support for appliances was welcomed in the one village where credit was offered directly to the developer. A deeper dive into our data also suggests that accessing energy-related loans may have enabled households to purchase more appliances up front. These both suggest that there is a demand for appliance financing. The Applied Energy Lab is currently testing appliance financing through the Energy Impact Fund in a village where the mini-grid has been

in operation longer and where many consumers already have initial appliances. With our financing support for the 24 new appliances, over half of which are fridges, we expect to increase the relative load from the main home appliances by 35%, providing additional revenue of US\$1,200 per year from this one-time offer of appliance financing. We anticipate that providing consumer financing on a rolling basis, or in stages, will result in even greater increases in consumption, as demand for larger appliances grows in future rounds of appliance financing.

3 Some customers indicated that appliance usage was limited due to high tariffs. Initial external data from Tanzania have shown that **reducing tariffs results in increased load and revenue.** Working with

developers to analyze tariff pricing sensitivity and their impact on appliance use will help optimize consumption and increase revenue.

4 In addition to testing scalable solutions, **rapid data collection methods from additional villages and developers will bring more accuracy to estimations of consumption,** enabling models to improve the prediction of energy demand and

potential revenue growth. Continued partnerships and resources will be needed to advance the efficiency and effectiveness of demand stimulation approaches that will transform the energy sector in rural Myanmar.

The Applied Energy Lab – in combination with the Energy Impact Fund for financing connections, appliances and productive use – is focused on solving some of the basic problems inherent in deploying mini-grids at scale in Myanmar. Our market assessment suggests that the potential viable mini-grid market could be as large as 16,000 mini-grids. Future technical notes will examine the impact of offering **financing for appliances** as well as **productive end-use** financing on the mini-grid business models.