Success story of solar mini-grids in India – Husk Power Systems

Company / financial institution

This success story focuses on the mini-grid sector in India and presents the investment profile Husk Power Systems. Husk Power Systems (HPS) builds, owns and operates power plants and smart mini-grids of capacity 27 kW – 50 kW in rural off-grid areas in Bihar and Uttar Pradesh. The Company's model consists of two types of customers: households (residential) and small scale businesses & factories (commercial).

Website: https://huskpowersystems.com/

Investments / financing

As of December 2021, **HPS has installed a total of 140 solar-hybrid mini-grids** in India and Tanzania and have raised **equity worth INR 2300 million (Euros 27.28 Million) and debt worth INR 240 million (Euros 2.8 Million).** Annual Turnover for the company has reached INR 29 Crores (EUR 3.49 Million) for year ending December 2021.

The table below reflects the **impact investments have made** in expanding the reach of HPS's mini-grids **to 140 in FY22** (as of December 2021).

Year	2012	2014	2016	2018	2019	2020	2021
Cumulative Installations	80 (biomass gasifier based)	91 (biomass gasifier based)	100 (biomass gasifier based)	21 (solar hybrid based)	62 (solar hybrid based)	114 (solar hybrid based)	140 (solar hybrid based)
	Series A equity worth **INR 400 Million (EUR 4.74 million)** mainly from Oasis Capital, Acumen and LGT Venture	Series B equity worth **INR 34 Million (EUR 0.4 million)** from First Solar		Series C equity worth **INR 185 Million (EUR 22 million)** from ENGIE, Swedfund, Shell Ventures & FMO		Raised debt of **INR 37 million (EUR 0.4 million)** from The Rockefeller Foundation	
	Raised debt of **INR 55 million (EUR 0.6 million)** from DFC / OPIC Loan			Raised debt of **INR 74 million (EUR 0.89 million)** from The Rockefeller Foundation			Raised debt of **INR 74 million (EUR 0.89 million)** from Open Road Alliance

Key success factors for investment / financing

- **Strong unit economics:** HPS has one of the world's lowest Opex and Levelized Cost of Electricity (LCOE) in the mini-grid business. It relies extensively on its Internet of Things (IoT) based remote monitoring and smart pre-paid metering technology which has helped the company in reducing unplanned downtime, maintenance costs and energy consumption through predictive maintenance.

- **Approaching right investors:** For HPS, approaching the right kind of investors, with understanding of the companies' business, has been critical. Furthermore, these companies have approached investors who shared a similar vision as them, e.g., The Rockefeller Foundation's investment in HPS on account of assisting in transformation of the lives of rural communities through providing energy access and spurring economic development. HPS has presented well-articulated and compelling value proposition to the investors including inputs like target market, problem being solved, benefits of the innovation and uniqueness over other alternative solutions.

- **Market and financial viability:** With the mini-grid idea in place, HPS have focused on defining the appropriate target market segments which has brought business scalability and financial soundness. For HPS, it meant targeting micro enterprises in villages which had traditionally relied on conventional fuels such as diesel to power their devices. The company has provided ready solutions to these segments in terms of price attractiveness and power reliability demanded by them. Further, this model has been sustainable and have the typical dynamics of an infrastructure project, with a payback period of 5-6 years.

- **Transparent and strong corporate governance:** HPS has Board-led structures whereby, the Board members have continued to remain engaged in decision making and their mentorship has been crucial in the institutionalization of knowledge. This has allowed continuity as also infusion of newer energy and ideas driving the company to the next level of growth. This has been a welcome step by investors.

Impact made on the society and environment

So far, HPS has served ~20,000 customers and has managed to generate an average income increase of 30% for its commercial customers. As far as environmental impact is concerned, HPS has been able to replace 349,035 Litres of diesel generation annually through its 140 commissioned plants in UP and Bihar. Also, ~2,000 tonnes of CO_2 emission reduction has been witnessed through the operations every year.

Possible elements for further growth of the subsector

The following elements would be beneficial in supporting the future growth of the mini-grid sector:

Efficiency improvement with remote project monitoring: The use of remote monitoring system improves project performance monitoring and utilization pattern and can help reduce need for manual intervention. The companies, through their common data centers, can remotely access their projects, its performance and space availability in real time basis for multiple units. This would help the companies to undertake analysis of the consumer demand over a period of time. Besides, the output from solar panels and performance of batteries can also be assessed, which allow for supply of electricity to consumers, as per their need.

Economies of scale leading to cost optimization: One of the key constituent of these units – solar panels, has set an example of considerable price drop with economies of scale. The other key cost element relate to batteries and storage systems which play an important role in supplying electricity during non-sunny hours. With promotion of domestic manufacturing of batteries, and wide scale adoption of battery storage systems across stationery and mobility applications, the cost of batteries is expected to reduce considerably to help improve economies of scale for mini-grid projects as well. This will further improve the financial viability of the projects, and subsequently the affordability of electricity from these projects.

Replicability of business model based on heavy loads: As per the analysis and consultations with developers and consumers, the business model focused on heavy loads/businesses (except for telecom towers or agricultural loads), linked with the community load has the high potential for replicability. With improvement in grid supply resulting in complete electrification of households mainly, the model will continue to be sustainable and financially viable, given the continuous electricity demand from the heavy loads. As per an estimate by GGGI , the estimated market size for RE-based mini grids in India stood at 5,000 starting 2017. Of this estimate, 2,800 micro / mini grids have been installed up until 2020 . Thereby, a market for 2,200 micro/mini grids still exist in India.

Skilling and employment opportunities: The implementation of mini-grid projects provide employment opportunities in the areas of operations and maintenance, security, consumer service and billing, collection. With expected increase in the number of such projects, these projects would offer skilling and employment opportunities to the local population.