



Business Model Design for DRE Enterprises and Rooftop Installations

CASE STUDY



SHAKTI
SUSTAINABLE ENERGY
FOUNDATION



intellectap

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Context

Shakti Sustainable Energy Foundation (SSEF) is a not-for-profit organisation committed to support India's developmental and energy security objectives. SSEF commissioned Intellecap Advisory Services to enhance access to finance for decentralised renewable energy (DRE) enterprises by providing requisite advisory support to such enterprises. As a part of the program, Intellecap is supporting DRE enterprises in designing solutions for

existing business-related issues that impact scale and sustainability as well as in implementing strategies for expansion and growth so as to guide them towards investment readiness. This document draws the key learnings of working with one of the DRE enterprises and captures the context, key challenges faced, solutions recommended and the expected outcomes over the near to medium-term.



About the Company

Rooftop Urja is an engineering, procurement and construction (EPC) solutions provider in the renewable energy sector. The enterprise specialises in installing solar net-metering and hybrid power plants for captive power consumption at rural households, institutions (schools and hospitals), and other commercial establishments such as fish and poultry farms. The enterprise works on an upfront- payment-based model where its customers pay in full post-commissioning of the plant/installations.

The enterprise has installed rooftop solutions in extremely remote areas, especially areas with no presence of central government grids. The enterprise is also empanelled with MNRE (Rating 'B') and PEC Limited for government installations on rooftop buildings. The founder's extensive experience of over 15 years in the technology sector has helped the firm execute multiple projects, with capacities ranging from 200 W to 80 kW, in the last 4-5 years.

Rooftop Urja maintains all interactions with consumers online. It requires potential consumers to fill an online form and submit details such as roof area, consumption pattern, etc., which is used by the firm for evaluation purposes. Further, it also shares the project cost, agreement, and invoices online as well as accepts online payments. Its presence on social media and platforms such as Amazon, Snapdeal and India Mart gives it a pan India reach. Consequently, the firm receives approximately 50-100 enquiries per month.

Background

Over the past two years, the rooftop solar market in India has grown at a compounded annual growth rate of over 90%. As of October 2016, the cumulative installed capacity stood at 1020 MW¹. Around 87% of the rooftop installations in India are based on the capital expenditure (CAPEX) model in which a customer invests upfront and does not receive maintenance support from the vendor enterprise. This model is followed by a large number of players. On the other hand, in case of operational expenditure (OPEX) model, the consumer doesn't have to pay upfront. Instead, payments are linked to the performance of the installation. This model has seen an annual growth rate of 189% over the past few years and is also expected to drive future growth of the sector.

Enterprises which currently follow the CAPEX model will likely look to transition to an OPEX model in future. These enterprises need assistance in identifying appropriate strategies consistent with their strengths and weaknesses that would allow them to penetrate the market with a new business model. This holds true for the rapidly evolving off-grid energy products market as well, where enterprises need to keep refining their business model and product offerings to be able to keep up with the innovations and changing consumer needs in this space.

As such, an engagement to redesign the business model for the above mentioned enterprise was undertaken so as help the enterprise in exploring a new business model for rooftop installations.



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Key Challenges

High upfront investment requirement for the CAPEX model

Typical rooftop solar installations in the commercial and industrial segments (around 150-200 KW,) cost upwards of INR 50- 60 lakhs. Commercial and industrial consumers are reluctant to invest such sums up front, especially for a non-core business activity.

Average installations in the residential segment (around 4-5 KW) cost INR 4-5 lakhs which is also a significant investment for this segment.

Operation and maintenance (O&M) of DRE installations is complex, time-consuming, and expensive

Consumers are not willing to take on the additional burden of O&M for rooftop solar installations since no such burden exists for grid power. Maintenance of these installations entail panel cleaning, monitoring of battery and inverter discharge, and other such activities on a regular basis for desired electricity production. Customers are neither equipped nor have time to perform the required O&M tasks. Further, most customers cannot afford additional resources needed for monitoring rooftop installations on a regular basis.

Availability of limited debt with high capital cost for rooftop installations

Banks are reluctant to lend to rooftop solar projects given the high perceived risks and limited information on the performance and track records of the installations. In the absence of collateral and lack of market for secondary sale of solar panels, the situation has become even worse. Where banks have lent for rooftop solar projects, the rate of interest has been high (nearly 15%) on account of high-risk perception.

High cost of customer acquisition

The customer acquisition cost in India is currently as high as 10-12% of the total installation cost which compares unfavourably to the costs in other developed nations such as Germany (4-5% of the total installation cost) due to limited awareness levels about rooftop solar installations in India. High customer acquisition cost has a domino effect; it increases transaction costs and eventually the overall cost of solar energy systems.



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Solution Themes

An enterprise migrating to a new business model (such as the OPEX business model) for rooftop solar segment, should take into account parameters such as target customer segment, value proposition offered, activities proposed, resources, distribution channel, and

partnerships available along with its own organization structure and financial projections. A 9-box framework as shown in Figure 1, if followed, can help enterprises mould their business model to suit changing industry requirements.

Figure 1: Business model suggested for DRE enterprises



Source: Intellectap analysis

Identification of customer segments

Enterprises should launch new business models in the existing geographies of their operation. This will enable them to leverage existing networks and local support in demonstrating proof of concept for the new model. It is however important to check for the existence of minimum support systems required for the pilot of business model. For example, the OPEX model in the solar rooftop segment should be piloted in states which have high electricity tariffs, effective net metering policies and potential for rooftop installations. As part of this particular assessment, Maharashtra and Karnataka have been identified as two key states for the pilot due to enterprise’s existing outreach. Additionally, both states have adopted net metering policy and witnessed growth of 70-80% in rooftop installations. These states are also expected to cumulatively install 18% of India’s 40 GW of rooftop target by 2022.

It was recommended that the enterprise should initially target commercial and industrial customer segments as

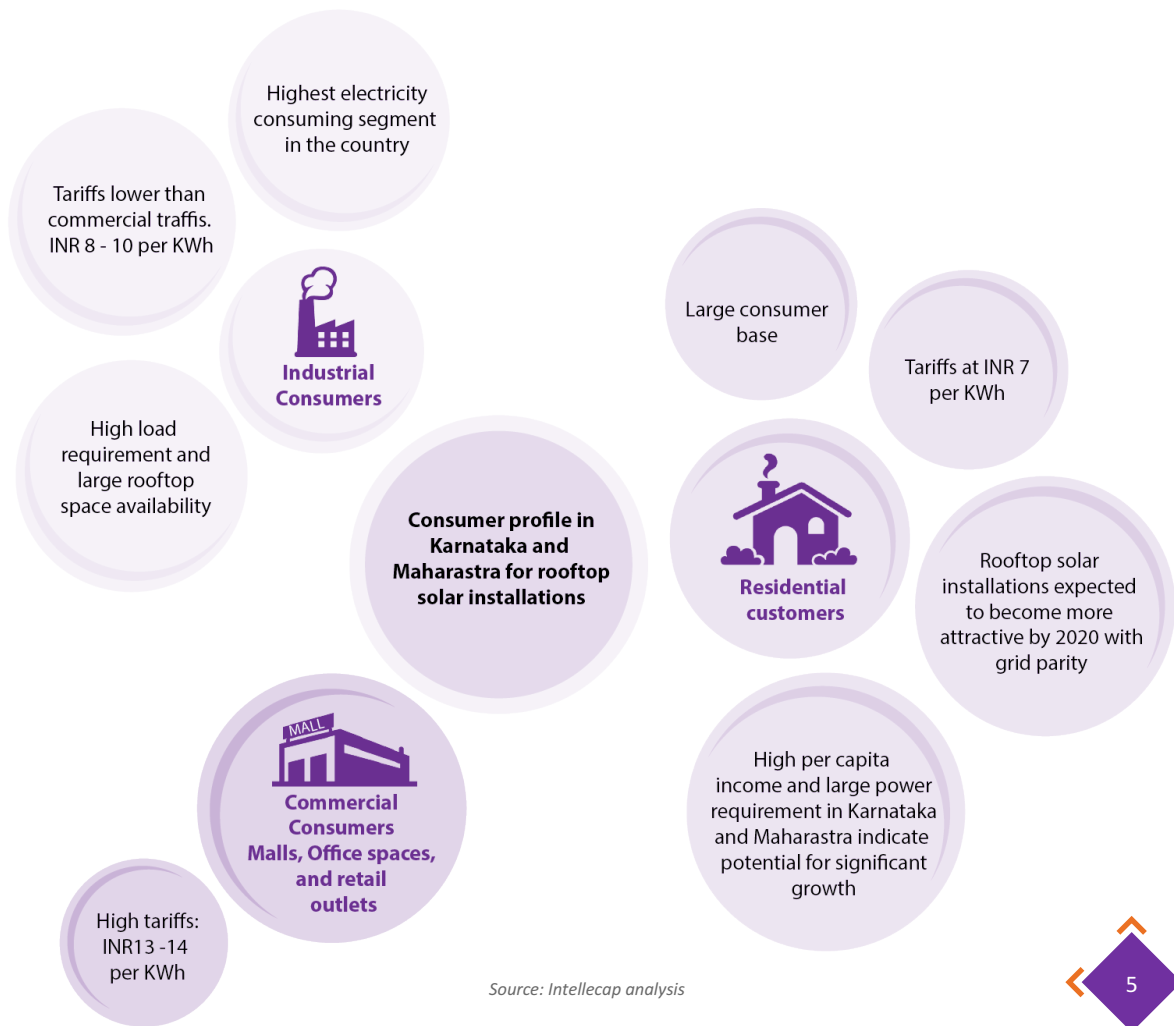
they usually pay higher tariffs (INR 8-14 per KWh) for grid electricity.

These tariffs are 15-20% more than what residential consumers pay. The aforementioned segment also constitutes a large percentage of the overall market (~70%).

Key requirements and value proposition

The key requirements of the OPEX model were highlighted to the enterprise to help them align their operations to consumers’ needs and focus on successful and profitable operations. Integrated project development, EPC, financing, and O&M services without involving multiple third-party services should be offered by the enterprise to reap full benefits under the OPEX model. Strategic use of innovative techniques, such as remote monitoring to record and share real-time data and demand assessment for consumers using GIS, were also recommended to help penetrate and build early partnerships in the market.

Figure 2: Consumer profile in Karnataka and Maharashtra for rooftop solar installations



Source: Intellectap analysis

Focus on quality and ease of use for the consumer

The enterprise should install high-quality, performance-centric designs and systems that are durable and cost-effective for the consumers. Statutory permissions, such as environmental clearance certificate, contract labour license from labour department, fire safety certificate from fire department and so on, should be obtained by the enterprise. The consumer should not be required to shoulder any responsibility on this front. The enterprise should also look into net metering arrangements as well as connectivity with distribution companies (DISCOMs).

Zeroing in on revenue drivers

Recommendations were shared with the enterprise to ensure that sufficient focus is given to areas that have the potential to be revenue drivers. It was recommended that a large number of installations (~70% of the total installations) should be located in Maharashtra since the state has high overall potential and also has costlier tariffs. The enterprise should plan operations in such a way that 70% of the target consumers are in commercial and industrial segments as these carry higher tariffs. Enterprises also need to understand the application process for government subsidy as these subsidies can serve as an additional revenue stream. The same was suggested to the enterprise supported during this program.

Cost structure: investment and returns

The OPEX model requires upfront investment from the enterprise which can be subsequently leveraged through debt. These funds could be raised as grant or equity capital from donors and impact investors. Investors have considerable interest in the segment as a conservative view of the growth of solar rooftop installations in India puts estimates at 13 GW by 2022, while an optimistic estimate pegs the target at 40 GW².

Given these growth estimates and capital intensiveness of the OPEX model, it is estimated that the enterprise will start generating positive return on equity (RoE) and return on assets (RoA) from the seventh year of operation.

Key resources required

Enterprises are advised to develop a team of skilled resources that have experience with the new business model. It was recommended that the enterprise has a business development team to interact with end consumers, understand their requirement, offer matching services, and negotiate prices. Further, within one year of operations, the enterprise should appoint a

business head to establish marketing and communication channels. In parallel, the enterprise should establish a design team responsible for designing the installations based on wind speed, roof elevation, shadow analysis and other relevant parameters. Initially, this could be done on a contractual basis. However, having a dedicated design team would ensure smooth operations, especially with the increase in plant size and frequency of projected installations. Going by the same logic, the enterprise should put in place a dedicated team for installation of systems on ground based on the designs provided.

Using appropriate marketing and distribution channels

In addition to using traditional channels (such as social media, blogs, etc.) innovative marketing strategies, such as strategic partnership with allies and aggregation of consumer demand, should also be evaluated. In the current context, partnership with real estate developers and aggregation of consumer demand across urban complexes were suggested to increase market share. As part of this study, specific recommendations were also made on the content for the website as well as publications. Suggestions included an update on offerings and communication of clearer value proposition for the end consumer. Appropriate platforms, events and conferences were shortlisted and recommended to be targeted for showcasing the business model and for business development.



Strategic partnerships and collaborations

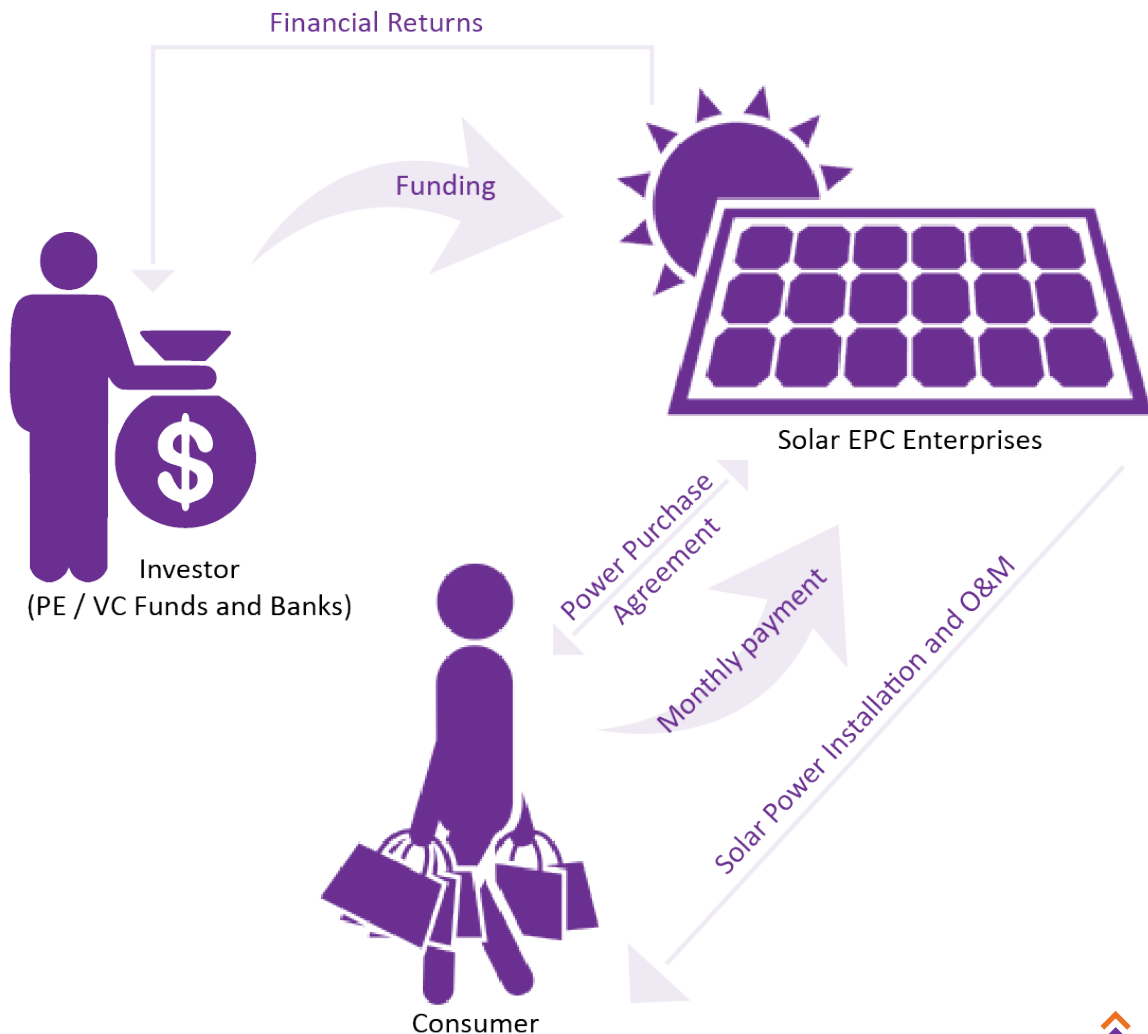
The enterprise should establish good working relationships with key players in the sector with an eye on long term growth and expansion. Collaborations with financial institutions, such as grant makers, equity investors and debt financiers, will help support projects with timely fund infusion. Establishing contacts with industrial associations can spur growth by providing access to large-scale commercial and industrial networks for rooftop installations. Government agencies, such as IREDA, SECI, PEC and GRIHA that have specific mandates to promote clean energy transition and green buildings, were identified as part of the study for mobilizing support and for piloting innovative rooftop models by using their on-going programs. Product dealers in the pilot states of Maharashtra and Karnataka were also

identified as partners to assist in after-sales support as well as marketing of the product in remote areas.

Organisation structure

Most early stage enterprises tend to adopt a flat organisation structure with one or two resources each for business development, installations, and managing HR related activities. However, after the initial 3-4 years, as enterprises scale, investing in resources and having a hierarchical and streamlined structure for business development, installations, HR, finance and accounts helps in managing large-scale installations better. Resource training and planning were identified as key areas of focus as part of this program for off-grid and rooftop businesses to scale.

Figure 3: Symbiotic relationships in the solar energy sector



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Way forward

Rooftop Urja has initiated discussions with customers and some of the partners suggested as part of the study. It has also approached commercial and industrial users for rooftop installations under the OPEX model.

Intellicap will continue supporting the enterprise in pivoting to the OPEX model and installing new systems customised to specific consumer needs.