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E-Hands Energy India Private Limited: Scaling Decentralised Renewable Energy for Social Impact

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Introduction

E Hands Energy (India) Private Limited, a Chennai-based social enterprise, was founded in 2009 with a business model of providing services to customers and communities in India's off-grid rural energy market. As CEO, Raghu Chandrasekaran prepared for a board meeting to finalise a plan for the next five years, supported by a fresh catalytic debt from Miller Centre Capital, he reflected on his decisions.

Subject Areas: Social Entrepreneurship, Business Model Innovation, Chaos Theory, Sustainable Energy, SDG Impact.

Company Profile

E-Hands Energy was incorporated in the year 2009 in Chennai. It designs and installs decentralised solar and hybrid systems, enabling rural institutions and communities across India to access clean, reliable renewable power. Since its inception in 2009, it has installed over 1,100 systems, replacing diesel and Kerosene with clean energy. This has led to access to electricity, improved banking services, and education for off-grid and rural communities. Its product portfolio includes solar, micro-wind turbines, hybrid solar-wind renewable energy and rural solar lighting solutions. It has a strategic partnership with the banking/financial service sector to promote affordable off-grid power to unpowered and underpowered rural and remote areas. [1]

Raghu reflected on E Hands' journey so far. With a strong commitment to creating social impact, he had chosen the decentralised renewable energy sector to provide off-grid and renewable energy to rural and remote communities in India. He strongly believed that access to affordable clean energy would have a ripple effect on people's lives and livelihoods. He had started his journey with a modest capital.

He pondered what the way was ahead?

Industry and Market Context

A fifth of India's population, around 270 million people, does not have access to electricity.[2] Rural and remote parts of India lack access to financial services like banking, which leads to further impediments

[1] . *https://www.ehandsenergy.in/about*

[2] World Bank State of Electricity Access Report, 2017

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in the development and integration of these areas. As banks remain inaccessible in such areas, 87% of the poorest households are unable to have access to credit, and 71% have no formal savings [3]

India has an increasing demand for energy due to its fast-paced development and population growth. It has demonstrated its commitment to sustainable energy by pledging to achieve NetZero emissions by 2070 and 50% renewable electricity by 2030. In this backdrop, decentralised renewable energy solutions can bridge the energy access gap by enabling access to energy in remote regions, agriculture, healthcare institutions, and microenterprises.

The DRE ecosystem encompasses solar home system providers, microgrid developers, irrigation pump manufacturers, battery and storage companies, NGOs, microfinance institutions, and other investors. The sector faces challenges like high initial capital cost, limitations in customer affordability, maintenance issues, collection concerns and policy uncertainty.

Raghu's Dilemma

He was in a dilemma.

Rural households offered high volumes but low, inconsistent payments, whereas an anchor-load business model would provide greater stability. In a Pay-as-you-go model, customers in off-grid or underserved areas can access solar power systems without incurring the full upfront capital cost. Users make small payments periodically to use the system through mobile money or cash. It provides customers with the flexibility to choose packages based on their needs. On the other hand, he could opt for the anchor business model where renewable energy systems have an anchor client (banks, Schools, NGOs etc) which would ensure a dependable revenue stream and lead to financial sustainability.

He weighed his options; the Pay G model required investment in costly hardware. He wanted to initiate change in off-grid regions, such as remote rural villages and the Himalayan region, which came with the challenge of expensive system installation. Logistical problems and maintenance issues were also a hurdle. Coupled with this was the problem of affordability in the Indian rural market. Only 22% of households globally without electricity can afford the monthly PAYG payment for a Tier 1 solar energy kit, while 49% could afford it at a stretch. [4]Conversely, E-Hands Energy could apply an anchor-load model by contracting an anchor such as a bank branch, school, or farmer-producer organisation (FPO)—and then using that stable cash flow to extend power services to smaller community users. This aligned with E-Hands Energy's focus on empowering rural India with sustainable, reliable electricity, paving the way for a brighter, cleaner future.[5]

He decided to go ahead with the anchor business model.

In 2011, E Hands Energy installed its first wind turbine, and by 2014, it had successfully commissioned its 100th site. [6]Powered by Oiko Credit's $200K loan, by 2017, 119 Union Bank branches in rural India and over 200 branches of Fullerton's Gram shakti Microfinance division in rural India had access to

[3] World Bank Improving Access to Finance for India's Rural Poor Report

[4] https://mtr.esmap.org/chapter-03-affordability-of-OGS

[5] *https://www.ehandsenergy.in/about*

[6] https://yourstory.com/companies/e-hands-energy--india-pvt-ltd

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solar power and reached 75,000 people in rural communities, while saving approximately 300 tonnes of CO2 equivalent.[7]

Technology

Initially, E-Hands Energy Private Limited imported technology from countries with which India had a trade agreement, such as the UK, Germany, and South Africa. Most of the dust- and moisture-free products were not suitable for the company's initial projects in the Himalayan region and rural India.. He looked for an alternative and started importing technology from Bangladesh, which had a more robust product suitable for Indian conditions and supplied Direct current. Later he went on to have a partnership with Japanese products and high-quality India products

Instead of relying solely on solar, the company decided to offer a hybrid model combining wind and solar. In the financial year 2025, the company pioneered the concept of repurposed Lithium Batteries in Microgrids, thus ensuring battery recycling. E Hands Energy also commissioned Horizontal Axis Wind turbines(small) with Solar PV as a Wind-Solar Hybrid in Microgrids. The company successfully synchronised the solar grid's voltage and frequency with those of the diesel generator, opening the way for them to install grid-connected solar in large health care facilities in rural India.

Growth Trajectory and Challenges

Raghu reminisced about his journey. In 2011, EHands Energy Private Limited received its first full payment for wind turbine installation. He bootstrapped early projects. By 2012, he had secured an order for the top MFI rural branch, which led to him receiving repeated institutional contracts, validating his B2B Anchor. By 2014, he had commissioned his 100th site. His adoption of hybrid technology increased revenue. The period from 2016-18 marked accelerated growth, with 570 kW installed. The company had also secured Oiko credit of $200, which enabled them to solarize 119 Union Bank branches. Their efforts impacted around 150k people and saved 2,500t of CO2. By 2020, the company had touched 700+ installations. It faced challenges during the Covid period. In August 2019, Miller Centre Capital extended an emergency loan, which helped E-Hands retain engineers, pay critical vendors, and restore power in rural communities. That loan was later fully repaid by the company. By 2022, the company rebounded through institutional scaling. By 2025, the company had 1000+ projects and 10 MW deployed across 780+ sites.

Funding

E-Hands Energy Pvt Ltd has relied on a mix of bootstrapped revenues, impact loans, and catalytic financing for its growth and expansion till 2025

Revenue Streams

Primary: B2B sales/installation contracts for solar/wind-hybrid systems to rural banks, MFIs, schools, Hospitals, and Farmer producer organisations.

Secondary: E-Hands Energy is among the top 5 enterprises in the world to monetize the Carbon Credits accrued from the De-Centralised Renewable Energy (DRE) installations (D-RECs). The Carbon Credits accrued by E-Hands Energy are considered as "High Impact" carbon credits. Besides, the Multi-year

[7] *https://www.maanaveeya.org/k/n5035/news/view/262471/41039/e-hands-solar-energy-for-india-s-unbanked.html*

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Operation & Maintenance service fees and AMC contracts contribute to the secondary revenue streams.

Micro-Level Changes Lead to Macro-Level Impact

Butterfly Effect

Solar Powered Banking

India's banking regulatory mandate requires 25% of new bank branches to be established in rural centres. Many of these areas experience power outages and irregular power supply. E-Hands Energy's systems enabled banking access for over 6.8 million customers, powering ATMs and replacing diesel generators at hundreds of locations. This micro-level change led to a macro-level impact. This led to a butterfly effect. With access to reliable power, banks provided banking services in rural and remote areas, enabling financial inclusion. This led to a feedback loop in which people had access to more credit, which, in turn, led to more local businesses flourishing.[8] This, in turn, led to more income generation. Farmers and microentrepreneurs use easier credit to invest in productivity-enhancing assets, which, in turn, increase local demand for reliable power and digital services. Banks also expanded their customer base, as a more reliable banking experience brought in new customers who previously didn't have the time for long waits or worried about never knowing when they would be able to access their money[9]

Solar-powered banking provided cheaper, reliable technology and also contributed to the reduction of carbon footprint, thus contributing to the mitigation of climate change.

Apart from solar-powered banking, E-Hands also partnered with grassroots organisations to provide 1KWpto 5KWp solar micro-grids to individual households, giving access to an affordable source of power. It also sells and distributes solar home lighting systems to rural families and micro-entrepreneurs. This access to reliable power allowed children more time to study, and also enabled more free time for women [10]

Reduced diesel uses by banks led to lower operating costs and emissions, which in turn allowed banks to make a greater impact. This enabled the company to enhance its impact narrative and gain access to impact capital enabling them to scale their operations and technology refinement.

[8] https://www.maanaveeya.org/k/n5035/news/view/262471/41039/e-hands-solar-energy-for-india-s-unbanked.html

[9] *https://www.context.news/net-zero/solar-power-opens-the-door-to-banking-for-rural-indians?utm_campaign=context&utm_medium=redirect&utm_content=article&utm_source=news-trust*

[10] *https://e4sv.org/interview-raghuraman-raghu-chandrasekaran-e-hands-energy/*

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Butterfly Effect

E Hands brought clean energy to around 150,000 people, electrifying 61 villages and deploying about 10 MW through more than 1,100 systems. These outcomes are not linearly predictable from the first decision to serve a single remote bank with a 1 kW p to 5Kwp system, but are path dependent leading to a much larger impact

SDG Goal Attainment

Solar-powered banks and institutions lowered operating costs and emissions. Enabled access to affordable, reliable, modern energy, which directly contributed to the achievement of SDG7.1, universal access to affordable, reliable, and modern energy services. With financial inclusion, income generation also increased, supporting the **achievement of SDG 1 (Poverty reduction). It also supports SDG10(Reduced inequalities via access to finance) by enabling financial inclusion in remote and rural areas. It actively contributed to SDG13(Climate action through avoided emissions**

As Raghu pondered his journey and looked ahead.

To continue with the anchor load business model or switch to the PAYG pivot?

The pay-as-you-go model scaled households faster but faced the risk of defaults. Should the company focus on expanding its anchor business for broader resilience, or invest in a PAYG model amid the looming threat of grid expansion

Which growth strategy would allow him to make a broader impact?

Rapid Geographic Expansion

E Hands Energy could prioritise expansion into energy-poor districts across India. This strategy could maximise reach and impact, but requires significant financing (Equity and debt), rapid team scaling, and strong coordination with state agencies and local institutions.

Partnership-Led Scaling

E Hands Energy could collaborate with state utilities, NGOs, farmer-producer organisations, agribusiness firms, and microfinance institutions to co-develop projects using shared infrastructure and distribution networks. This approach reduced the capital burden and accelerated deployment, but it could also lead to coordination issues.

Profit vs. Livelihood Integration?

Should the company focus only on providing affordable energy access or on livelihood integration. By integrating it with activities that help generate income and livelihoods.

As Raghu prepared for the upcoming board strategy meeting, he reflected on the enterprise's founding mission to make clean energy access commercially viable and socially transformative empowering people in rural and remote places. His decision would shape not only his company's growth trajectory but also help him contribute to India's clean energy transition.

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Exhibit 1

Timeline Of Key Events And Cascading Effect

Year	***Key Event***	***Immediate effect***	***Cascading Butterfly effect***
2009	*E Hands India Private Limited was incorporated* *Micro wind trial*		
2011	First revenue from wind turbine sale	*Single customer payment*	*Validates commercial viability, enables MFI order*
2012	*Wind/SPV technology*	*4 rural branches of NBFC powered*	*Leads to hybrid tech validation*
2014	*100th site commissioned*	*Consolidation of institutional B2B*	*Emergence of anchor load model of business*
2017	$200K Oikocredit loan for 119 Union Bank branches and 200+ branches of Gramshakti	320 sites solarized year; 75K people reached; 300 $MTtCO_2$ saved	950K people gain financial access over 3 years; E Hand team grows to 40
2025	Miller Centre funding; 1,100+ systems,1000^{TH} SITE COMMISIONED IN 2024	10MW deployed; 61 villages electrified	6.8M people financially included via 815+ bank solar branches

Authors own creation using the following sources

Source:https://yourstory.com/companies/e-hands-energy--india-pvt-ltd, illercenterglobal.org/miller-center-capital-funds-e-hands-energy-to-expand-rural-solar-access-in-india/

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EXHIBIT -2

BUSINESS MODEL CANVAS

Block	**Description**
Key Partners	Renewable energy (RE) manufacturers; NGOs and grassroots organizations for distribution; financial institutions (e.g., Oikocredit for impact loans); banks/microfinance institutions (MFIs) as co-finance partners; ADB's "Energy For All" program.
Key Activities	Site assessments; customized system design (solar PV, micro-wind hybrids, mini-grids, rooftop systems); end-to-end installation and commissioning; maintenance and remote monitoring; securing permissions and grid connections where possible.
Key Resources	Technical expertise in hybrid RE tech; 570+ kW installed capacity experience (as of ~2014, scaled since); partnerships network; impact capital access.
Value Propositions	Affordable, reliable, sustainable clean energy replacing diesel generators; 50% cost savings; uninterrupted power for ICT/banking; CO_2 reductions; tailored for rural needs (e.g., 1 kW for bank branches); enables financial inclusion and productive use.
Customer Relationships	Long-term service contracts; personalized consultations; ongoing maintenance support; B2B account management for institutions.
Channels	Direct B2B sales to rural institutions; partnerships with NGOs for household reach; website inquiries; industry events/awards networks.
Customer Segments	Primary: Rural bank branches, MFIs, Regional Rural Banks (RRBs), schools, FPOs, small businesses (B2B). Secondary: Rural households, micro-entrepreneurs, first-time users via micro-grids/home systems; urban rooftops.
Cost Structure	Capex for panels/turbines/batteries; installation labor; maintenance; site assessments; financing costs (impact loans); R&D for hybrids.
Revenue Streams	Direct sales/installation contracts; multi-year service/maintenance fees; impact investor loans repaid via project revenues; potential urban rooftop sales.

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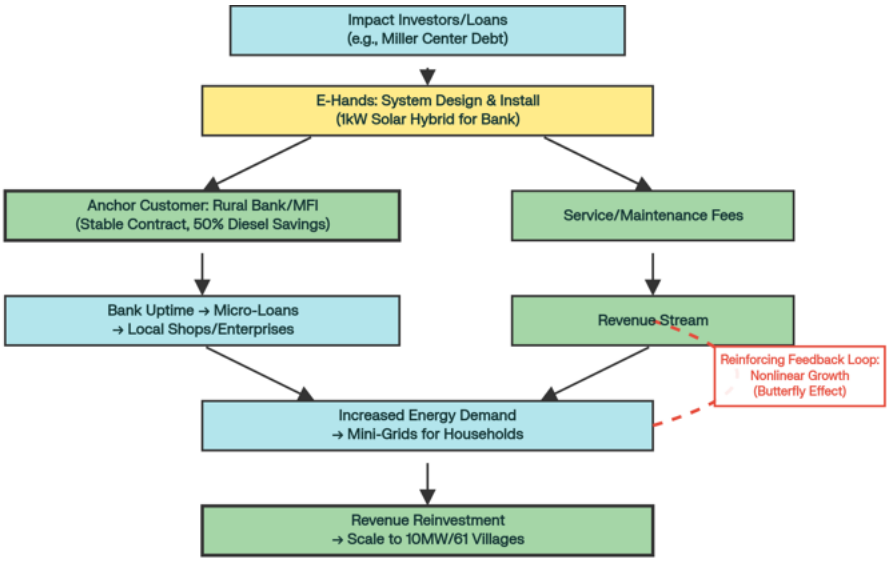
EXHIBIT 3

E HANDS ANCHOR LOAD REVENUE MODEL



Dilemma	Context	Decision Taken	Outcome
Anchor B2B vs. Direct-to-Household	Households risky (low payments, high logistics); PAYG tech costly per unit	Prioritise reliable institutions (banks/MFIs) as anchors to subsidise villages/micro-grids.	Scaled to 815+ branches, 6.8M customers; avoided PAYG capex
Wind/Solar Hybrids vs. Pure Solar	Early imports are expensive/fragile for the Himalayas (dust, moisture) .	Partnership with Japanese products/ high quality India products; hybrid solution for reliability and energy generation	Solar capacity of 10MW managed, pan-India; diesel replacement made viable.

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