Understanding the Ecosystem of Social Enterprises in the Renewable Energy Space in India

FEBRUARY 2013

Submitted to:

THE NAND & JEET KHEMKA FOUNDATION

Submitted by:

Intellecap
SHAPING OUTCOMES

Intellecap (Hyderabad)
5th Floor, Building no 8-2-682/1
Road No 12, Banjara Hills
Hyderabad – 500 034
INDIA
Phone: +91 40 4030 0200

About Intellecap

Intellecap is a pioneer in providing innovative business solutions that help build and scale profitable and sustainable enterprises dedicated to social and environmental change. The company's unique positioning at the intersection of social and commercial business sectors allows it to attract and nurture intellectual capital that combines the business training of the commercial world with the passion and commitment of the social world to shape distinctive solutions. Intellecap was founded in 2002 and has more than 100 employees. Intellecap has worked with more than 60 clients on over 250 engagements across 15 countries. For more information, please visit www.intellecap.com

About Intellecap Consulting and Research Practice

Intellecap's Business Consulting and Research Practice area offers strategic advisory services to international development organizations, businesses, and governments that seek to engage with BoP markets. These include market-based strategy solutions, high-quality and comprehensive research, and thought leadership that can be used to facilitate and direct business, investment, and market decisions to create a positive impact for people at the BoP. We combine our business acumen with a deep understanding of development issues to help clients around the world.

- Our expertise in solving strategic challenges across industries and markets enables us to bring a rigorous analytical approach to addressing development issues.
- Our research, independent and commissioned, drives thought leadership and is designed to promote actionable solutions to BoP challenges in Intellecap's Focus Sectors and to function at the enterprise, sector and policy levels.
- Our understanding of the rural and low-income consumers drives our ability to address many of the complex challenges when working at the BoP.
- Our ability to drive multi-stakeholder partnerships that involve Corporations, Social Enterprises, Multilateral Agencies and Development Finance Institutions, and Donors enables us to innovate in delivering high impact solutions.

For more information, please contact:
Nisha Dutt,
nisha.dutt@intellecap.com
+91.40.4030.0277

Intellecap (Hyderabad)
5th Floor,
Building no 8-2-682/1
Road No 12,
Banjara Hills
Hyderabad – 500 034
INDIA
Phone: +91 40 4030 0200

Intellecap (Mumbai)
13A, 6th Floor, Techniplex –
II IT Park,
Off Veer Savarkar Flyover,
Goregaon (West),
Hyderabad – 400 062.
INDIA
Phone: +91 22 6195 2700

Table of Contents

List of Abbreviations

AIC	Ashden India Collective
BPL	Below Poverty Line
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
DFID	Department for International Development
GBI	Generation-Based Incentive
GIZ	Deutsche Gesellschaft Für Internationale Zusammenarbeit
GoI	Government of India
GW	Giga Watt
IDFC	Infrastructure Development Finance Company
IFC	International Finance Corporation
INR	Indian Rupee
IREDA	India Renewable Energy Development Agency
JNNSM	Jawaharlal Nehru National Solar Mission
MNRE	Ministry Of New And Renewable Energy
MoP	Ministry Of Power
MSME	Micro, Small And Medium Enterprises
MW	Megawatt
NGO	Non-Governmental Organization
PV	Photovoltaic
RE	Renewable Energy
REN21	Renewable Energy Policy Network for the 21st Century
REWG	Renewable Energy Working Group
RPO	Renewable Purchase Obligation
S3IDF	Small Scale Sustainable Infrastructure Development Fund
SEC	State Electricity Board
SEWA	Self Employed Women's Association
SME	Small- And Medium-Sized Enterprise
TERI	The Energy And Resources Institute
USAID	United States Agency For International Development
USD	U.S. Dollar
Wp	Watt Peak

Acknowledgements

We would like to convey our sincere thanks to Hari Natarajan, Senior Technical Expert, IGEN-RE, GIZ, Dr. Madhukar Shukla, Professor, Xavier School of Management (XLRI), Svati Bhogle, Managing Director, Sustaintech India, Thomas Pullenkav, Independent Consultant and Sr. Advisor, Energy, Villgro, and other members of the Renewable Energy Working Group (REWG) for sharing their insights and helping shape the direction of this research.

This study would not have been possible without insights and suggestions from the practitioners whom we reached out to. We would like to gratefully acknowledge their time and candour.

We would also like to thank The Nand & Jeet Khemka Foundation, Fondazione Fem Onlus, Cariplo Foundation and the Vismara Foundation for commissioning and supporting this study.

Authors:
Shree Ravindranath
Lina Sonne
Sowmya Suryanarayanan
Anar Bhatt

Please do not copy, quote or reproduce without the express written consent of The Nand & Jeet Khemka Foundation

Executive Summary

Nearly 7.5 crore (75 million) Indians are off the grid, mostly in rural areas, and use inefficient sources of energy such as biomass and charcoal for their daily needs. These populations are often from the economically weaker sections, and live in a deeply patriarchal societal structure, where women have little say in household decision-making.The challenges to reaching such unreached and underserved consumers are accessibility, affordability, acceptability of alternatives and outreach efficiency for bridging the last mile.

Distributed generation and supply of electricity, combined with the use of locally available renewable sources of energy is an accepted strategy to increase energy access. Reducing technology costs and subsidies play an important role in addressing the affordability gap. Technology is also an important factor in improving energy efficiency. Market-building activities that include consumer awareness and education are critical to making new and better technologies more acceptable. Private enterprises seem best placed to bridge the last mile.

There is great diversity in enterprises operating in the renewable energy space - pre-revenue startups and established companies with revenues greater than INR 1000 crore (USD 200 million) are all part of it. For this report, the focus is on Renewable Energy Social Enterprises (RESEs) defined as those that:

- Focus on Bottom of the Pyramid Markets to create positive social and environmental impact, trying to reach the poor and distributed populations;
- Are often promoted by First Generation Entrepreneurs (FGEs), with less focus on those promoted by corporations;
- Operate off grid. These enterprises are mainly of 2 kinds – those that mimic grids such as mini and micro grids, and those that distribute renewable energy products such as home systems, lighting and heating solutions to the end consumer.

Data reveals that a large number of RESEs are young and in the early stages of establishment, and the RESE space in general seems to be moving from a phase of uncoordinated innovation to that of marketplace building, aligned? to the phases of industry evolution. Thus, a support ecosystem that provides startup support would be most relevant to this scenario.

Successful startup ecosystems such as Silicon Valley may be used as a basis for analyzing the available infrastructure and mapping the gaps. The three types of support analyzed in the report are:

- Finance: includes early stage and soft funding;
- Enterprise Support: includes incubators, mentoring, furthering a startup mindset, and other service providers;
- Sector Building Support: infrastructure for financing, policy

The study found the following infrastructure and areas for intervention in the RESE space –

Table 1 – Infrastructure and Areas for Intervention in the RESE Space

	Available Infrastructure	Areas for Intervention
Finance Support	• General Social Enterprise focused funds such as Aavishkaar and Acumen; • Limited commercial lenders; • Limited RESE focused lenders, such as IntelleGrow.	• Funds with a strategic focus for RESEs, such as The Solar Fund; • Incentives and risk-mitigants for commercial lenders to consider lending to RESEs; • Greater scale and reach of RESE focused lenders; • More Angel Funders and increased amounts of very early stage funding available for RESEs.
Enterprise Support	• Limited support to help RESEs develop and demonstrate business models, such as seed funding and incubators; • Government run incubators focused on commercial renewable enterprises; • Limited number of private incubators, only one with a focus on RESEs (SELCO).	• Systematic support to help RESEs develop more robust business models; • More private incubators with a focus and understanding of the RESE space; • Peer learning opportunities and platforms; • Coordination with corporations targeting the same market.
Sector Building Support	• Nascent donor-co-ordination efforts leading to discussions on funding direction; • Different, loosely interconnected policy advocacy efforts such as The Ashden India Collective, the Renewable Energy Working Group; • Limited support to social enterprise startup thinking and mindset in educational institutions; • Restrictive broader startup and doing business legal and policy environment.	• Focused donor and market maker coordination efforts; • Co-ordinated consumer education and financing efforts; • Focused subsidy regime to help achieve maximum impact; • More startup thinking in academic institutions; • More conducive starting up and closure processes for companies; • A variety of legal and policy structures for investment raising and exits.

Based on these gaps, the study recommends short, medium and long-term interventions by various stakeholders, as mentioned in Table 2.

Table 2 – Recommendation on Interventions by Various Stakeholders

	Short Term	Medium Term	Long Term
Enterprises	• Learn from similar business models that have community based models in other sectors such as water and sanitation; • Adopt international impact reporting standards for RESEs such as IRIS or other platforms.	• Explore partnerships with large corporations to establish last mile rural distribution networks, such as through ITC e-choupals; • Peer-to-Peer information sharing to create new market opportunities for RESEs.	• Make RESE business models more robust and flexible to reduce dependence on subsidies and grants, amongst others.
Investors	• Encourage adoption of international impact reporting standards for RESEs such as IRIS or other platforms.	• Raise strategic RESE focused funds with a mandate of investing in energy enterprises; • Develop Angel Networks for high-risk capital, networks and business expertise for RESEs with teams that understand the business similar to those in other startup ecosystems; • Support capacity building systems such as accelerators and incubators.	• Deepen and formalize relationships among investors focusing on various stages of enterprise development, to reduce effort required in raising consecutive rounds of funding for enterprises.
Donors	• Coordinate existing consumer education and awareness building for RESE products; • Develop and facilitate delivery of trainings for business and capital structuring	• Support and facilitate creation and operation of institutions to facilitate consumer financing of RESE products, possibly similar to NABARD and SIDBI; • Create platforms to facilitate options for investor exits for RESEs, beyond the current limited choices of secondary	• Create strong and self-sustaining infrastructure for RESEs.

	for RESEs; • Unify and co-ordinate advocacy efforts at central and state levels in the renewable energy sector.	stake sale or listing.	
Networks and Forums	• Recognize and feature regional players in the RESE space by expanding outreach efforts to second tier towns; • Focus on regional language forums to reach out to local entrepreneurs.		• Develop active forums to facilitate dialogue, action and sharing of results among stakeholders in the RE space.
Policy Makers/ Government	• Reduce compliance burden and timeframe of subsidy release for RESEs.	• Develop performance based-quality standards for RESE products as compared to the current design based standards; • Set up and encourage process and service level certification/standardization for RESEs; • Reconsider the role of incentives and subsidies provided to renewable energy sector with a view towards making the sector more streamlined and sustainable.	• Simplify policy framework for RESEs; • Create policy framework for attracting capital and for a variety of options for investors to exit; • Convergence of MSME and RESE framework, with dedicated agencies for RESEs.

There are several aspects of the infrastructure support ecosystem that are beyond the scope of this research study, but a deeper understanding of the same may facilitate the growth of the RESE space:

- **Sustainability of sector infrastructure:** Donors and sector stakeholders are coordinating to create sector infrastructure, such as the REWG. However, this infrastructure itself needs to be sustainable;

- **Capacity building requirements of RESEs:** An understanding of the capacity building requirements for RESEs by connecting them with promoters and CEOs of the RESEs. This would help conceptualize the appropriate exposure, training and other systematic capacity

building initiatives that they would find valuable to their businesses, as well as assist in their endeavors to fine-tune their business plans;

- **Marketing and consumer awareness**: A comprehensive study of and identification of successful and scalable models of product marketing and creating consumer awareness to Bottom of the Pyramid markets from various sectors with a view to tailoring them for the RESE space would add valuable knowledge.

Overview of the Report

The Nand & Jeet Khemka Foundation (NJKF, http://khemkafoundation.net/) is actively addressing challenges in the renewable energy space in India, both through public events such as the Khemka Forum for Social Entrepreneurship (Khemka Forum), as well as by facilitating sector-focused initiatives such as the Renewable Energy Working Group (REWG), with support from donors. The NJKF also supports research and dissemination of knowledge that assists in this effort. This report compiled by Intellecap, titled "Understanding the Ecosystem for renewable energy social enterprises in India", is one such study.

The report is based on secondary and primary research. Secondary research includes the scenario in India and relevant ecosystems globally. The primary data is drawn from a purposive interview sample of over 20 sector stakeholders, including entrepreneurs, angel investors, incubators, enablers, consultants and facilitators engaging with the renewable energy space in India (Refer Annexure-I for list of Interviewees).

Section 1 of the report outlines the population affected by lack of energy access, and the need for enterprises to reach un-served markets. It also defines the enterprises for which the analysis in this report is likely to be most beneficial. The section provides an overview of the current state of the available infrastructure for renewable energy enterprises, while also outlining the components that make up a successful support ecosystem, including support for finance, enterprise and sector building.

Section 2 maps the support ecosystem in general, and puts the spotlight on specific initiatives for renewables in the context of this report. It also provides an overview of the challenges and gaps existing in the evolving ecosystem with respect to a more mature, successful support system.

Section 3 provides recommendations for various stakeholders in the renewable space, and also highlights a few areas that could be studied further.

1. Introduction

According to estimates, nearly 7.5 crore (75 million) people are off the grid in India, of which approximately 92% live in rural areas.[1] Roughly, 69% of India's population use biomass for cooking,[2] 51% of the population use subsidized kerosene for lighting.[3] The country is power-deficient with the peak shortfall being 10-14% across states.[4]

A majority of the energy-deficient population is from economically weaker sections. It is a challenge for them to mobilize lumpsums of money, including the cash to pay for energy-efficient products and alternative sources of energy. Much of the energy in these households is used indoors, and incomplete combustion coupled with poor ventilation negatively impacts the health of the women, children and senior citizens. Technology adoption for efficient cooking and heating solutions is low; since women, who are often the main users of the new technology, typically have little say in economic decisions.[5] More often than not, traversing the last mile is expensive.[6] Therefore, the challenges in reaching the unreached and underserved consumers are accessibility, affordability, acceptability of alternatives and outreach efficiency for bridging the last mile.

While India has recorded a world-beating INR 51,500 crore (USD 10.3 Billion) in clean energy investment in 2011, this growth has come largely from investments in grid-connected solar and wind power projects.[7] Given the large overall power shortfall in the country, this additional capacity may have a small impact on under-electrified and off-grid consumers.

Distributed generation and supply of electricity, combined with use of locally available and renewable sources is an accepted strategy to increase energy access.[8] Reducing technology costs and subsidies play an important role in addressing the affordability gap. Technology is also an important factor in improving energy efficiency, which makes renewable energy products affordable over time. Market-building activities that include consumer awareness and education are critical to making new and better technologies more acceptable. Private enterprises focused on reaching the unreached with a view towards creating a sustainable business model from the endeavor seem best placed to overcome these challenges sustainably.

1.1 The renewable energy social enterprise space

There is great diversity in enterprises operating in the renewable energy space - pre-revenue startups and established companies with revenues greater than INR 1000 crore (USD 200 Million) are all part of it. The enterprises work with various sources of renewable energy, including solar, hydroelectric, biomass and wind, amongst others. Even within energy sources, technologies differ significantly. The enterprises may be mission-driven to create social and/or environmental impact, focused on generating financial returns, or more often, focus on both (known as Social Enterprises

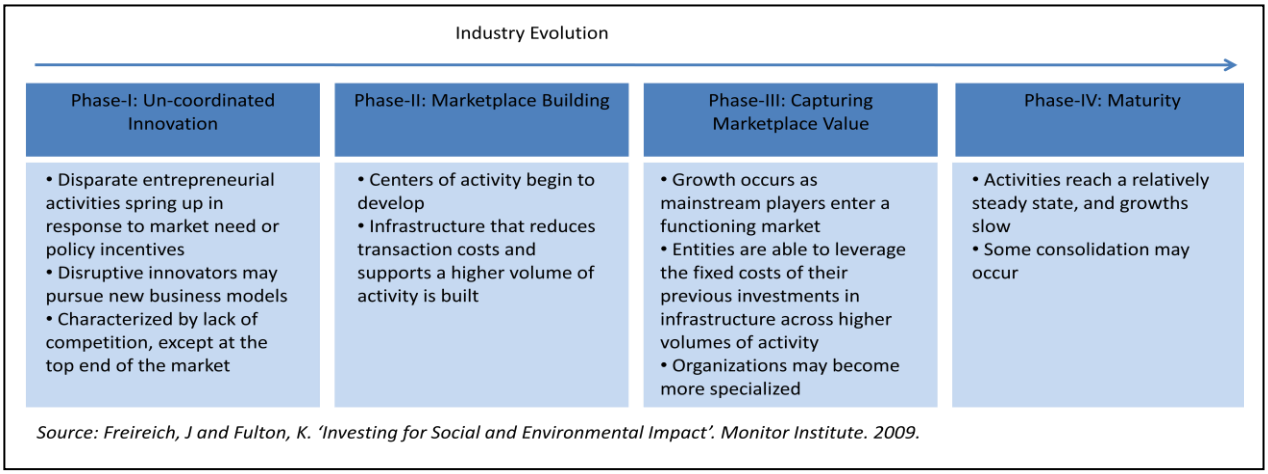
[1] Lighting Asia, http://intellecap.com/sites/default/files/publications/Updated%20Final%20Lighting%20Asia%20Off%20Grid%20Report%2007252012.pdf
[2] International Energy Agency. http://www.iea.org/publications/freepublications/publication/cooking.pdf
[3] Lighting Asia, http://intellecap.com/sites/default/files/publications/Updated%20Final%20Lighting%20Asia%20Off%20Grid%20Report%2007252012.pdf
[4] 'Load Generation Balance report 2012-13.'Central Electricity Authority. Ministry of Power.GoI.<http://cea.nic.in/reports/yearly/lgbr_report.pdf>
[5] Rai, K and McDonald, J. 'Cookstoves and Markets: Experiences, Successes and Opportunities'. GVEP International. December 2009. <http://www.hedon.info/docs/GVEP_Markets_and_Cookstoves__.pdf>
[6] Dr. Maithani,P.C. 'Energy Access in India Special Reference to Renewable Energy Options.' International Seminar on Energy Access.MNRE.GoI. October 2012. <http://www.energyaccess.in/FinalEnergyBook.pdf>
[7] 'India saw record $10.3bn clean energy investment in 2011.' Bloomberg New Energy Finance. 02 Feb 2012. <http://www.bnef.com/PressReleases/view/186>
[8] Arora D.S., et al. 'Indian Renewable Energy Status Report.' Background Report for DIREC 2010.National Renewable Energy Laboratory.GTZ. REN21. Secretariat in France, and IRADe in India. October 2010. <http://www.nrel.gov/docs/fy11osti/48948.pdf>

or SEs for the purposes of this report). They may be promoted by corporations or entrepreneurs, and may be grid-connected or operating off-grid. For the purpose of this report, the focus is on enterprises that:

- Focus on Bottom of the Pyramid markets to create positive social and environmental impact, trying to reach the poor and distributed populations;
- Are often promoted by First Generation Entrepreneurs (FGEs), with less focus on those promoted by corporations;
- Operate off grid. These enterprises are mainly of 2 kinds – those that mimic grids such as mini and micro grids, and those that distribute renewable energy products such as home systems, lighting and heating solutions to the end consumer.

These enterprises are termed Renewable Energy Social Enterprises (RESEs) throughout this report.

Figure 1 – Matrix of Industry Evolution



Since 1995, when one of the earliest RESEs, SELCO, was founded, an ecosystem of support and service providers focusing on RESEs has developed, similar to the ecosystem in an industry (see Figure 1: Matrix of Industry Evolution).

According to Intellecap's survey of 95 social enterprises in 2012[9], the number of enterprises in the clean energy sector experienced the most growth established in any Social Enterprise sector over the last two years; of the 23 that responded to the survey, 14 had revenues of under INR 50 lakhs (USD 92,000). From a database of 49 renewable energy enterprises (refer Annexure-II), 37 were founded between 2005 and 2012, indicating that a large number of RESEs are young and in the early stages of establishment.

RESEs operate in diverse geographies with the hotspots being in Mumbai, Delhi, Bangalore and Hyderabad as per Intellecap's Social Enterprise Survey. The un-penetrated market of low-income, energy-deprived consumers targeted by the RESEs is still significant, and geographically spread out; thus there is limited competition amongst RESEs. It seems that the RESE space is gradually moving from a stage of Un-coordinated Innovation to that of Marketplace Building. Thus, a support ecosystem, which provides startup support, would be the most relevant to this scenario.

[9]'On the Path to Sustainability and Scale.A study of India's Social Enterprise Landscape'.Intellecap. 2012. <http://intellecap.com/assets/156/intellecap_landscape_report_web.pdf>

1.2 A successful startup ecosystem

While most successful examples of an evolved support ecosystem for technology based enterprises are from the developed world, learning from what they provide, and further adapting them to the Indian context for the RESE space would be appropriate. Silicon Valley[10], ranked at the top amongst the world's startup ecosystems by Startup Genome[11], is a good example.

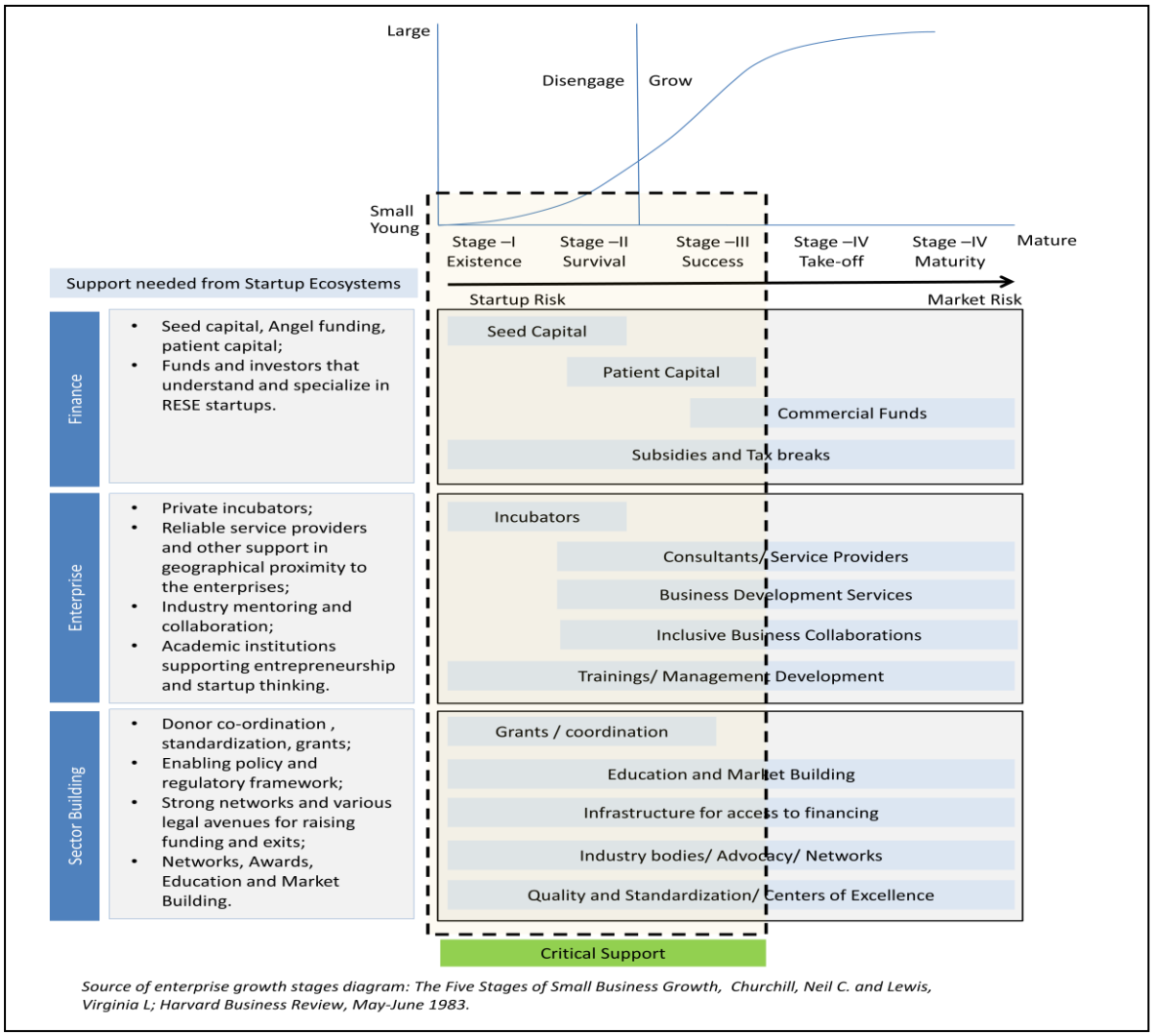
There are three major kinds of support that such startup ecosystems provide viz. Finance, Enterprise, and Sector Building Support.

- **Finance** – One important feature of startup ecosystems is the presence of angels and super angels for early stage funding. These investors usually fund several startup enterprises and are typically those who have made their wealth by being in the same industry as they are investing in. This experience ensures that they understand the details and risks of the investments that they are making. Further, funds that have a strategic focus on certain kinds of technology startups are also an integral part of the ecosystem. The available funding also includes grants, and other soft funding in certain cases.
- **Enterprise Support** – Enterprise support includes incubators, mentoring, furthering a startup mindset, and other service providers. Incubators may be promoted either by the Government of the area, or by private individuals. Government promoted incubators are often housed within academic institutions, most importantly ones that are known for furthering the spirit of entrepreneurship. Stanford has two centers for entrepreneurship namely Centre for Entrepreneurial Studies (CES), and Stanford Technology Ventures Program (STVP) at the School of engineering. Similarly, Harvard's iLab91 situated within Harvard University fosters entrepreneurship and innovation among students. These academic institutions also provide a pool of talented youngsters with the necessary skills and mindset to contribute to the startups. Incubators promoted by private entities, such as Y Combinator, provide seed funding and access to business networks for the entrepreneurs that they associate with. Within the ecosystem, many large companies also collaborate and partner with startups. These large companies provide the mentoring and connections needed for the startups to succeed, while also being the pool of talented and trained executives that may go on to staff the startups. Most startup ecosystems include support providers such as accountants, lawyers, consultants and other service providers in close proximity.
- **Sector Building** – In most startup ecosystems, this aspect is heavily influenced by respective Government interventions. Evolved regulations on company creation and dissolution, IP protection and licensing, facilitating easy export and import of technologies, products and parts, play an important role in making it easy for startups to get off the ground. While advocacy is needed for specific issues, the backbone of the ecosystem already exists. The provision of different legal structures for incorporation is an important part of these ecosystems. In addition, a variety of legal options for raising capital and providing exits to investors are important to facilitate the easy flow of investments into startups. For example, the US has 7 different avenues for raising early stage funding.[12] The exercise of raising capital in these ecosystems is relatively easier for a successful startup post the first round, as startup teams and investors alike are strongly networked. In addition, investors with a

[10]Simoudis, E. "Silicon Valley's Defining Characteristics". Enterprise Irregulars. 12 September 2010; Harvard Club of Silicon Valley website; Mac, R. "Top Startup Incubators And Accelerators: Y Combinator Tops With $7.8 Billion In Value". Forbes. 30 April 2012.
[11]http://blog.startupcompass.co/pages/entrepreneurship-ecosystem-report
[12]Prosperity fund analysis, DfID: http://ukinindia.fco.gov.uk/resources/en/pdf/CCU/ChallengesFacedByFGEsinIndia

focus on different stages of companies are also strongly interlinked, and hence enterprises are able to move from angel, to seed and Venture Capital (VC), private equity and listing with relative ease. A recent report by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)[13] that mapped support systems for the SE space in general revealed that while some of these entities focus on RESEs, most of them are generic to the SE space. While the above support aspects are broadly needed in order to make a startup ecosystem successful, each element needs to be customized to the Indian and RESE context in order to provide better support. Figure 2 provides a snapshot of the support elements in the light of enterprise growth stages.

Figure 2: Startup Ecosystem and Enterprise Stages of Growth



Source of enterprise growth stages diagram: The Five Stages of Small Business Growth, Churchill, Neil C. and Lewis, Virginia L; Harvard Business Review, May-June 1983.

[13] 'Enablers for Change - A Market Landscape of the Indian Social Enterprise Ecosystem'.GIZ. 2012. <http://www.giz.de/Themen/en/.../giz2012-enablers-for-change-india-en.pdf>

2. Sector Infrastructure

2.1 Finance support

Finance and Enterprise

A report by the Planning Commission of India on Early Stage Investing estimates that the capital required between 2012-2021 is to the tune of INR 3 Lakh crore (USD 60Bn). Of this, an estimated INR 1 Lakh crore (USD 20 Billion) consists of VC funding, INR 15,000 crore (USD 3 Billion) of angel funding, INR 15,000 crore (USD 3 Billion) of incubator and seed funding and approximately INR 1.45 Lakh crore (USD 29 Billion) of debt funding.[14]

> "Our primary investment decision criteria are related to the promoters and the business model. We look for businesses that will be able to give us an exit at the end of our investment horizon by becoming attractive to other funds or strategic investors."
>
> **Noshir Colah, Aavishkaar**

Currently, angel funding in India is estimated to be INR 100 crore (USD 1 Billion) annually, VC funding around INR 5,000 crore (50 Billion), while incubator and seed funding is much smaller in comparison, providing significant potential for growth. Investments in social ventures alone are set to grow to INR 5,000 crore (USD 1 Billion) by 2017. [15] Hence, it is reasonable to expect more sources and volumes of early-stage seed capital, equity and debt funding for RESEs.

Equity investors (also called investors in this report) however, often state that it is difficult to find enterprises that have the ability to absorb the available funding volume. For example, Aavishkaar and Acumen, two of the best-known funds that have made early-stage investments in RESEs, together have a target of investing INR 11,000 crore (USD 220 Million) across their focus sectors by 2017. However, they have been able to invest only INR 253 crore (USD 50.6 Million). While Aavishkaar had invested INR 145 Crore (USD 29 Million)[16] as of March 2012, Acumen has been able to deploy INR 108 crore (USD 21.6mn)[17], as per November 2011 reports.

Investors take into account several financial and strategic factors while investing, including background, capability and commitment of the promoters, commercial viability of the business, enterprise's attractiveness to other funders, etc. Investors who understand the RESE space note that, given the lack of proven business models, it is necessary to look for enterprises with the potential for market success.

RESEs raise debt through banks and through SME and RE focused lenders such as IntelleGrow. Debt providers assess an enterprise on the same broad criteria as equity investors. However, their evaluation of risk is from a shorter timeframe. Seed funders, grant makers and business plan competitions consider the same broad criteria as equity investors do; however, they are more flexible and choose to fund and support even unproven business models provided business logic can be communicated. Seed funding is given to ideas and startup enterprises, and often comes with early stage venture support. Grants, though, may often be project based.

[14] 'Creating a Vibrant Entrepreneurial Ecosystem in India. Report of The Committee on Angel Investment& Early Stage Venture Capital.' Planning Commission. GoI. June 2012. <http://planningcommission.nic.in/reports/genrep/rep_eco2708.pdf>
[15] *Ibid.*
[16] Annual Impact Report 2012.Aavishkaar.2012 <http://www.aavishkaar.in/wp-content/uploads/2012/11/Aavishkaar-social-Report_small.pdf>
[17] Acumen Fund website.<http://www.acumenfund.org/investments/countries/india.html>

Box 1: Impact Reporting and Investments Standards

Impact Reporting and Investments Standards (IRIS) measures social, environmental, and financial performance metrics using standard definitions and broad performance indicators that can be applied to any organization across sectors.

The indicators are organized in categories such as organization description, product description, financial performance, operational impact, and product impact. Reporting data is submitted by funds and enterprises that have adopted IRIS.

IRIS published its report "Data Driven: A Performance Analysis for the Impact Investing Industry" in September 2011. This report provides a preview of the metrics that will emerge through more widespread reporting on the platform, and would be useful for the following stakeholders:

- **For fund managers, investors and other stakeholders working with mission-driven organizations**: Aggregated data that can help to set social, environmental, and financial performance expectations across portfolios, and inform due diligence into prospective investments
- **For entrepreneurs**: Much-needed context for individual company performance, as well as the ability to gauge impact relative to that of industry peers
- **For researchers/ academics**: More rigorous studies on the effectiveness of impact

However, investors are increasingly emphasizing the need to report impact. Aavishkaar has evolved a framework for impact assessment and reporting for its investees, and Acumen Fund has signed on as Global Impact Investing and Reporting Standards (GIIRS) Pioneer Fund (see Box 1: Impact Reporting Standards).

One important aspect of the potential of an RESE is the ability to create exit options. As the RESE industry stands, there seem to be two possible options for equity investors to exit, viz. buy-out by other funds, or takeover by a larger company in order to acquire the RESE's Intellectual Property (IP), customer base, or outreach networks. Investor exit through listing seems to be a long-term goal.

At the same time, in mission driven organizations such as many RESEs are, it is an important aspect to address, as investors with return expectations would bring in some change in organizational strategy and thinking. It is thus very important for RESEs to carefully choose both, the quantity and the quality of money that they plan to raise.

Box 2 – Innovative Rural Sales and Distribution

Companies such as Project Dharma have emerged in the recent past to bridge product distribution and maintenance gaps. The Project has created a rural distribution network by training village level entrepreneurs in stocking, selling and providing maintenance services, which enables the product suppliers to reach out to remote locations efficiently.

Project Dharma currently has 400 village level entrepreneurs in the states of Uttar Pradesh, Bihar and Madhya Pradesh. The training for entrepreneurs is in progress in few other states such as Karnataka.

In order to address some challenges of low confidence in product quality and sales and service, models that focus on after-sales service are now developing (see Box 2: Innovative Rural Sales and Distribution), and seem to be moving in the right direction.

Areas for Intervention

While there are investors and debt providers for RESEs, there seems to be a lack of focus on RESEs alone. Enterprises from other emerging and impact sectors such as healthcare and agriculture compete with RESEs for funding from impact investors. In addition, there seems to be a limited angel and early-stage funding available for the space, especially from people who understand the business by dint of having practiced it for a significant length of time.

> "Raising both working capital as well as equity is always a real challenge, and most importantly, very time-consuming for an early-stage social enterprise working at the Bottom of the Economic Pyramid in India. I've witnessed many great potential social enterprises struggle with fundraising, and some may even close down for lack of funds."
>
> **Michael MacHarg, Simpa Networks**

2.2 Enterprise support

Incubation and Business Model Support

Incubation services aim to facilitate social enterprises in numerous ways right from the ideation and start-up stages. They help enterprises identify business opportunities, understand social challenges, provide access to investor networks and create business models. Some incubators also provide financial support through grants, seed and equity. A number of incubators have been set up by the government, and housed in academic institutions such as the IIMs and IITs, largely with a focus on purely commercial technology driven enterprises. However, private incubators are now emerging specifically to cater to social enterprises, with clean energy being one focus area. For instance, Arctic Holdings incubated Barefoot Power and Cycle Chalao; Avantage Ventures and SELCO incubated Onergy and D.Light Design; Villgro provides incubation support with seed funding, grants and even equity and has supported enterprises such as Servals Automation.

With increasing number of RESEs entering this space, there are new incubators that are coming up to focus on the needs of RESEs. For example, SELCO launched its incubation center in 2012 to help sustainable RESEs to deliver energy solutions to low-income communities in India.

> "Under its Lighting Asia - India program, IFC is working with companies to develop scalable and replicable business models attractive to investors and also plans to support access to finance solutions for working capital, growth capital and end consumer financing going forward."
>
> **Anjali Garg, IFC**

Many RESEs also look for support to refine their business models. Incubators, including institutions such as IFC and CIIE are helping enterprises in building a strong business model, by analyzing their businesses, finances and technologies.

Business Development Services and Collaborations

Organizations such as Sun Moksha have partnered with Ecoforge and New Ventures India (NVI) to provide business development services to environmentally focused SMEs. They also mentor entrepreneurs coming from forums like MentorEdge India and NVI. Other players such as the Small Scale Sustainable Infrastructure Development Fund (S3IDF) develop and deliver RESE focused packages of support services for entrepreneurs. This package includes financial assistance, technological know-how, and business development support. The entrepreneur earns revenue from his / her enterprise and pays for the services to S3IDF.

Several RESEs are exploring partnerships with larger players from mainstream retail and FMCG (Fast Moving Consumer Goods) businesses to bridge the last mile. Such collaborations with corporations and other entities running rural hubs that see increased aggregation of rural consumers, including procurement outlets such as *e-choupals*, networks for distribution of agricultural inputs and machinery, *mandis* and procurement centers etc. could be critical for broadening outreach.

Areas for intervention

The existing incubators are largely generic, with the exception of some government facilities, which are in turn focused on commercial renewable ventures and not on RESEs. In addition, the working language of all the support institutions is English, but in a country where entrepreneurs and innovations impacting the grassroots may be rooted in the grassroots, there is a need to reach out to those entrepreneurs who may be comfortable in the vernacular.

There are also limited peer learning platforms that can help enterprises reaching a common market learn from the innovations and challenges faced by others. For example community based models of drinking water provision and mini-grids have a similar working model that of decentralized production followed by cost effective distribution. Alternatively, large corporates that have products targeted at the bottom of the pyramid markets may be able to share insights on how they tackle consumer financing and other issues.

Service providers with an in-depth understanding of the renewable energy space, along with the complexities of reaching the bottom of the pyramid markets are few at present. There is a significant learning curve to scale for these service providers.

2.3 Sector building support

Financing

The infrastructure for financing, both patient equity and debt, is currently being developed. While there has been support from funders such as The French Development Agency (AFD) and others to government institutions such as IREDA for large infrastructure projects, several players are beginning to intervene directly in the private sector.

IFC and The Shell Foundation have been very active in working with private sector players, in addition to making direct investments in enterprises. USAID and IFC have an option of providing loan guarantees to facilitate debt financing to renewables. IFC has provided targeted financing facilities though several investments, and has also made equity investments into Renewable Energy Enterprises[18], including select RESEs. The Shell Foundation has emerged as an important player in the support ecosystem for RESEs. Support from the Foundation has covered several critical areas, including awareness building; market creation, an RESE accelerator, and a dedicated debt facility, amongst others (refer Annexure III for details). However, with the exception of some select initiatives, these facilities are yet to widely service RESEs.

The GoI is also working in partnership with institutions to channelize the benefits of its schemes. Since mainstream credit rating parameters may not be suitable for small enterprises, Center for Innovation, Incubation and Entrepreneurship (CIIE) in IIM, Ahmedabad is a proposed channel partner for credit ratings of enterprises that would benefit from Jawaharlal Nehru National Solar

[18] IFC website: http://www1.ifc.org/wps/wcm/connect/80dcba80478ce205bfcdbf86d3bfc329/Renewables+June+2012.pdf?MOD=AJPERES

Mission (JNNSM). The GoI has also set up a Center of Excellence, to be housed within CIIE, which would process subsidies, especially for small entrepreneurs in the sector. CIIE also manages an early-stage incubator and fund called INFUSE (Indian Fund for Sustainable Energy), which works with ventures focused on sustainable energy, including RESEs.

Other generic facilities such as the Credit Guarantee Fund Scheme for Micro and Small Enterprises (CGMSE) launched by the GoI offers collateral-free credit to the MSME sector, and would also support RESEs in theory, though accessing the support is a challenge at present.

Awareness and Network Creation

While there has been considerable media attention about the relevance of clean energy for sustainable growth, investments in consumer awareness creation continues to be small.

Educating consumers about choosing an alternative product to meet their energy needs continues to remain a challenge as a result of lack of information access, social and cultural attitudes prevalent in rural areas. Targeted grants for awareness building, government driven campaigns, and a large number of private players and RESEs investing in customer education are beginning to have a positive effect on the market.

> "Consumer financing for purchase of RESE products should be customized based on income patterns of the customers."
>
> **Thomas Pullenkav, Independent Consultant**

Educating and training rural bankers regarding RESEs is also a challenge. While managers and loan officers at the rural banks understand the need for tractors, fertilizers, and machineries, they are not familiar with the risks and associated decision-making criteria for renewable energy equipment. In addition, customer-financing partners such as MFIs too, need to be sensitized to the requirements of RESEs, and to find ways of collaborating with them. To address these challenges, IFC is developing training modules for bankers and MFIs to help them understand renewable energy products, assess risk and make better decisions while offering a loan for clean energy products.

Creating platforms that facilitate networking are important to highlight the opportunities existing in the RESE space. Such platforms also provide visibility of enterprises amongst investors and other stakeholders. Sankalp Unconvention, The Khemka Forum on Social Entrepreneurship, The Ashden Awards, and others are examples of these platforms. Further, alumni of awards are also coming together to make a difference to the space (see Box 3: Ashden India Collective).

While most competitions and networking events have thus far focused on enterprises based in larger Indian cities, there seems to be a gradual recognition of the need to reach out to regional enterprises. In October 2012, Intellecap organized its first Sankalp Regional Summit to encourage

Box 3: Ashden India Collective

In 2010, the Ashden India Collective (AIC- http://www.ashden.org/india-renewable-energy-collective) was set up by more than 15 Indian Ashden awards winners, aiming to accelerate access to renewable energy in the country by influencing national policies. AIC has completed three round-tables in 2011, funded in partnership with DfID (through UKAID), titled 'Scaling up of Off-grid Renewables', to discuss a set of key issues and recommendations with policy makers.

The collective efforts of the members of AIC, the Nand & Jeet Khemka Foundation and others have resulted in the Reserve Bank of India including lending to household renewable energy applications as a priority sector lending.

Source: http://panchabuta.com/2012/10/17/ashden-lauds-indias-15-20-growth-rate-in-off-grid-electrification/

entrepreneurship in low-income Indian states in collaboration with the DFID and GIZ. Similarly, SELCO incubation center organized its first workshop in September 2012 with focus on the North Eastern states in India to encourage potential entrepreneurs and identify incubatees. In addition, the importance of conducting these forums in regional languages is also being recognized and discussions are underway to initiate interactions in regional languages.

IFC and other donors in the renewables space have also started a donor co-ordination initiative. During the Lighting Asia program, IFC brought together several donors to the discussion table and facilitated a sharing of plans in order to minimize the overlaps in other donors' efforts. The interaction not only led to sharing of lessons and designing a more effective implementation design for their Lighting India program, but also led to donors strategies that are geared to minimize overlaps.

Standardization and Testing

Clean energy products are technology-oriented, thus quality and standardization are key to establish better confidence among consumers on product quality.

To address this challenge, MNRE has developed design standards for the lanterns they procure for their subsidy program. However, there are many enterprises that offer quality products, but do not qualify for the subsidy since they do not meet the MNRE guidelines, which are design based. The Bureau of Indian Standards (BIS) has set up a technical committee that is working on bringing out quality-assurance standards for LED-based solar lanterns, and also for forced-draught and natural draught cook stoves. This committee is being headed by MNRE and includes prominent actors such as IFC and The Energy Research Institute (TERI). Facilitated by the MNRE, IIT-Delhi is in the process of setting up a center for testing renewable energy cook stoves.

Human Resources

To meet the demand for skilled workforce in the new and renewable energy sector, the GoI has implemented fellowship programs such as National Renewable Energy Fellowship Programme and National Solar Science Fellowship Program to institutionalize renewable energy education and training by strengthening educational institutions such as IIT Delhi that are active in imparting renewable energy education at a formal level. Various initiatives such as the award of Renewable Energy Chairs, monetary support for laboratory and library upgradation, fellowships, course development etc., have been incorporated besides supporting innovative and incubator activities.

In addition, incubators such as Villgro also provide part time resources, such as interns chosen after careful screening and profile matching.

Areas for Intervention

Donors and development financial institutions in the RESE ecosystem context play a unique supporting role very similar to that of the Government in evolved ecosystems. Several donors have recognized the challenge for RESEs, and are undertaking efforts to support them. Recently, they have also begun to co-ordinate their efforts. There needs to be much more progress with respect to these efforts.

A systematic and widespread effort for consumer awareness is needed in order to help the rural consumers make informed choices about their product purchases. Currently past experience with sub-standard products where there was no service and maintenance support provided, may have left consumers disgruntled and wary of investing in genuine products that may solve at least a part of their energy needs.

Coordination between enterprises that are on ground and academic institutions, centers of excellence and standardization and testing initiatives need to be implemented. The industry needs to help these centers focus on prioritizing the kinds of infrastructure that needs to be set up, such as prioritizing the infrastructure for testing based on market readiness and requirements.

One area to explore to ease the human resource challenges is to tie up with corporations for sabbaticals of their mid-to senior management, which could act as a retention tool for the corporate, while at the same time creating management bandwidth and valuable connections for the RESEs. This is a common strategy in evolved startup ecosystems, where senior managers with established companies are provided with unpaid time off from their parent company to help support smaller startups.

From a larger policy and entrepreneurship perspective, there is a need to create a more conducive environment to support ease of starting up, and doing business. There is also a need to bring together advocacy initiatives under one umbrella, possibly by drawing representatives from various policy groups to create focused sub-committees that co-ordinate for advocacy. The following table provides a snapshot of the available infrastructure and the gaps in the ecosystem for RESEs.

Table 3 – Ecosystem Roundup

	Available Infrastructure	Gaps
Finance Support	• General Social Enterprise focused funds such as Aavishkaar and Acumen; • Limited commercial lenders; • Limited RESE focused lenders, such as IntelleGrow.	• Funds with a strategic focus for RESEs; • Incentives and risk-mitigants for commercial lenders to consider lending to RESEs; • Greater scale and reach of RESE focused lenders; • More Angel Funders and increased amounts of very early stage funding available for RESEs.
Enterprise Support	• Limited support to help RESEs develop and demonstrate business models, such as seed funding and incubators; • Government run incubators focused on commercial renewable enterprises; • Limited number of private incubators, only one with a focus on RESEs (SELCO).	• Systematic support to help RESEs develop more robust business models; • More private incubators with a focus and understanding of the RESE space; • Peer learning opportunities and platforms; • Coordination with corporations targeting the same market.
Sector Building Support	• Nascent donor-co-ordination efforts leading to discussions on funding direction; • Different, loosely interconnected policy advocacy efforts such as The Ashden India Collective, the Renewable Energy Working Group; • Limited support to social enterprise startup thinking and	• Focused donor and market maker coordination efforts; • Co-ordinated consumer education and financing efforts; • Focused subsidy regime to help achieve maximum impact; • More startup thinking in academic institutions; • More conducive starting up and closure processes for companies;

	mindset in educational institutions; • Restrictive broader startup and doing business legal and policy environment.	• A variety of legal and policy structures for investment raising and exits.

3. Recommendations

As the renewable energy sector moves forward, an ecosystem of support players must evolve and work effectively to cater to the specific needs and challenges of the RESEs over time. It is evident from this research study that the most critical gaps at present are in the early stages of growth of RESEs.

Given the practical difficulties in managing change in the diverse RESE space, the efforts made to create the support ecosystem may be best implemented in a phased and prioritized manner. The timeframes for these efforts may need to broadly follow investment horizons for patient capital, as the phases of industry development and enterprise growth are often marked by a change in the ownership or investment structure of the enterprises.

Assuming an investment horizon of 7-10 years, the interventions may be divided into those that will yield fruit in the short term (over the next 1-2 years), the medium term (over the next 2-5 years), and those that may fructify in the long-term. The short-term interventions can be implemented with minimal efforts by stakeholders. The medium term interventions would provide the sustained efforts that are required to support RESEs with infrastructure-creating investments, and the infrastructure thus created will need to be coordinated and leveraged. Following this, RESEs would be firmly on the path to maturity in the long term. RESEs and the support infrastructure itself should, by then, be able to support and sustain with minimum intervention from donors and other agencies.

For Enterprises

Short Term

- **Cross Sector Learning:** There is an opportunity to learn from products and services that are being offered to comparable Bottom of the Pyramid markets across various sectors. For example, HUL Pureit is a household water purifier that uses simple technology to purify water even in rural areas. However, despite the robust product, uptake has not been to the extent desired - the main challenge being consumer financing, a similar constraint faced by Product RESEs. In addition, community based models for sale of potable water have been in existence, where communities buy water from a central plant, similar to the micro and mini grid models. Understanding the challenges of similar models in other sectors may result in applicable solutions to the RESE's challenges.
- **Impact Reporting:** Voluntarily reporting performance and impact to a suitable impact-reporting platform, which will assist in creating peer benchmarks for use as business intelligence and strengthening the enterprise's Unique Selling Proposition (USP) to investors.

Medium Term

- **Partnerships with Large Corporations:** RESEs have an opportunity to identify large corporations and industry players in complementary business fields and build pioneering partnerships that are sustainable in the long term. This would result in risk-reduction and make RESEs more attractive to investors. For instance, some RESEs are in discussion with agri-input marketing firms, beverage companies, and/or FMCGs companies to use their established retail infrastructure in remote locations for last mile distribution of products.
- **Peer-to-Peer Networking:** Active information exchange among RESEs could open up market opportunities for newer enterprises, as well as help them collectively draw out strategies to overcome challenges in the sector.

Long Term

- **Sustainable Business Models:** Constantly scan for opportunities to make business model more robust and flexible. Explore avenues to reduce dependence on subsidies, grants and other forms of soft funding and support.

For Investors

Short term

- **Impact Reporting:** While impact reporting is not center stage for a majority of investors at present, a number of leading investors are adopting international impact reporting standards such as IRIS or other platforms. Investors should encourage this trend, as it will help investors, entrepreneurs and other stakeholders alike to understand and compare RESE benchmarks across the country and possibly across the globe.
- **Collaboration:** Create platforms for active RESE support providers such as IFC, Shell Foundation, and Lemelson Foundation to share knowledge and prioritize areas that require immediate intervention.

Medium term

- **RE focused Funds:** Raise funds with a strategic RESE focus, and have investment teams specialize and understand the sector. Funds with strategic focus on renewable energy would also be able to create scale and value through mergers and acquisitions, thus leading to alternative exit options for investors.
- **Build Angel Networks:** Identify ways to increase angel/seed funding. In addition to providing high risk capital, the investor's regional and global networks and business expertise would help RESEs grow.
- **Capacity Building:** Although the primary focus should be on investing directly in RESEs, simultaneously supporting business support systems such as accelerators is crucial as an intervention that builds a pipeline of investable companies.

Long term

- **Create Investor Networks:** Deeper relationships among investors focusing on various stages of enterprise development will help seamless movement from one stage of funding to another, similar to Silicon Valley in the USA.

For Donors

Short term

- **Consumer Awareness:** Coordinate existing efforts for consumer education and awareness by the GoI, state governments, and other donors in order to use funds efficiently.
- **Structured Training Programs for enterprise and capital structuring:** Donors could support the development and delivery of trainings that would help RESEs gain a better understanding of hybrid incorporation structures (NGO and for-profit), as well as capital structuring. This would help RESEs structure their business appropriately, and raise the right kind of capital- grant, equity, debt, etc.
- **Unify and Co-ordinate the Advocacy Efforts at Central and State levels, make it self-sustainable:** Bring together forums/groups such as AIC, REWG, and other players, create

sub-groups focused on renewable energy sector, while working to achieve a larger common purpose under a single umbrella. This would help reduce duplication and create a single strong body with more influence on shaping policy. In addition, an independent, self-sustainable policy advocacy body that is able to voice the concerns of its members strongly (similar to MFIN for Microfinance) may be considered.

Medium term

- **Consumer Financing:** Donors could help create the infrastructure to support RESE product companies for customer financing. Financing support through a market-oriented apex institution might be an option, but further research is needed for developing an appropriate solution.
- **Help create platforms for investor exits:** While there is an SME exchange in India, there is no systematic platform that helps create a pipeline of SMEs that are looking to list. Similarly, RESEs need an appropriate platform to help prepare a pipeline of enterprises that will move from the current stage of funding to the next, through a variety of channels based on their business growth.

Long term

- **Emphasize Sustainability of Sector Infrastructure:** Donors play an important role in creating the sector infrastructure for addressing gaps in the support ecosystem. However, it is important that this infrastructure be strong and self-sustaining, so that donor funding and support would progressively reduce over time and lead to market based solutions.

For Networks and Forums

Short to medium term

- **Act Local:** While national level forums put the spotlight on larger players, it is important to also recognize and feature regional players. There is a need to create in depth entrepreneur search by focusing on regions and geographies across the country.
- **Use Vernacular:** Most of the forums that are currently active are held in English. This reduces the likelihood of grassroots innovators and entrepreneurs who have in depth knowledge of the local markets to leverage the strengths of the forums. Outreach activities and discussions in the forums should also take place in the local language in order to overcome these challenges.

Long term

- **Create Sustainable and Active Forums:** Create active, always-on, focused communities that have defined commitments and can deliver results. To facilitate dialogue and exchange of ideas among various stakeholders in the renewable energy sector, as well as build stronger networks and partnerships.

For Policy Makers/ Government

Short term

- **Reduce Compliance Burden and Timeframe of Subsidy Release for RESEs:** Streamlining the process by making better use of technology and electronic media would assist the RESEs to focus on their work and outreach.

Medium term

- **Product Standardization:** While MNRE has facilitated standards for some products, rapid advancement in technologies may have made these standards obsolete. For example, standards for most products are design oriented, but new designs that may be producing better results may not qualify for government support. Standards need to be oriented towards outputs and outcomes as opposed to design, and this needs to be facilitated and completed within a short timeframe. IFC and TERI are already working with MNRE to create quality assurance standards, which harmonize BIS standards with International Standards, of renewable energy products. However, the pace of change needs to be faster, in order to keep up with changing technologies.
- **Set up and Encourage Process and Service Level Certification/Standardization:** One important aspect of customer acquisition and retention is the after sales maintenance and service provided for the products. The government needs to identify genuine players in the renewable energy sector from those entities that merely sell products. This may be done through an accreditation by an industry apex institution similar to a Self-Regulatory Organization, and benchmarking minimum quality standards for members of this organization.
- **Reconsider the role of subsidy:** The government needs to reconsider the role of subsidy by identifying areas where it is best suited, how it can be most productively used, and related issues.

Long term

- **Simplify Policy Framework for doing Business:** The current policy framework is complicated, and doing business in the current framework is a challenge, especially for small enterprises. It will be useful to move to a simpler regime that would require less time and costs for compliance.
- **Alternatives for Investor Exit from Small Companies:** Policies and regulatory framework must provide for alternate routes of raising capital and create conducive policies for easier environments for investor exit.
- **Convergence of MSME and Renewables Framework:** The GoI has recognized the need for supporting the MSME sector in India; however, there is little on-ground convergence between the two sets of policies and implementation agencies.

Table 4 – Summary of Recommendations

	Short Term	Medium Term	Long Term
Enterprises	• Learn from similar business models that have community based models in other sectors such as water and sanitation; • Adopt international impact reporting standards for RESEs such as IRIS or other platforms.	• Explore partnerships with large corporations to establish last mile rural distribution networks, such as through ITC e-choupals; • Peer to Peer information sharing to create new market opportunities for RESEs.	• Make RESE business models more robust and flexible to reduce dependence on subsidies and grants, amongst others.
Investors	• Encourage adoption of international impact reporting standards for RESEs such as IRIS or other platforms.	• Raise strategic RESE focused funds with a mandate of investing in energy enterprises; • Develop Angel Networks for high-risk capital, networks and business expertise for RESEs with teams that understand the business similar to those in other startup ecosystems; • Support capacity building systems such as accelerators and incubators.	• Deepen and formalize relationships among investors focusing on various stages of enterprise development, to reduce effort required in raising consecutive rounds of funding for enterprises.
Donors	• Coordinate existing consumer education and awareness building for RESE products; • Develop and facilitate delivery of trainings for business and capital structuring for RESEs; • Unify and co-ordinate advocacy efforts at central and state levels in the renewable energy sector.	• Support and facilitate creation and operation of institutions to facilitate consumer financing of RESE products, possibly similar to NABARD and SIDBI; • Create platforms to facilitate options for investor exits for RESEs, beyond the current limited choices of secondary stake sale or listing.	• Create strong and self-sustaining infrastructure for RESEs.
Networks and Forums	• Recognize and feature regional players in the RESE space by expanding outreach efforts to second tier towns; • Focus on regional language forums to locate local entrepreneurs.		• Develop active forums to facilitate dialogue, action and sharing of results among stakeholders in the

			RE space.
Policy Makers/ Government	• Reduce compliance burden and timeframe of subsidy release for RESEs.	• Develop performance based-quality standards for RESE products as compared to the current design based standards; • Set up and encourage process and service level certification/standardization for RESEs; • Reconsider the role of incentives and subsidies provided to renewable energy sector with a view towards making the sector more streamlined and sustainable.	• Simplify policy framework for RESEs; • Create policy framework for attracting capital and for a variety of options for investor exits; • Convergence of MSME and RESE framework, with dedicated agencies for RESEs.

4. Next Steps

There are several aspects of the infrastructure support ecosystem that are beyond the scope of this research study, but a deeper understanding of which may facilitate the growth of the RESE space:

- **Sustainability of sector infrastructure:** Donors and sector stakeholders are coordinating to create sector infrastructure, such as the REWG. However, this infrastructure itself needs to be sustainable. A study of the required infrastructure and how to make them self-sustaining by drawing on examples from other successful models would be an important step.
- **Capacity building requirements of RESEs:** An understanding of the capacity building requirements for RESEs and a plan to plug these gaps would be important to create the appropriate infrastructure.
- **Marketing and consumer awareness:** A comprehensive study of and identification of successful and scalable models of product marketing and creating consumer awareness to Bottom of the Pyramid markets from various sectors with a view to tailoring them for the RESE space would add valuable knowledge.

5. Annexures

5.1 List of interviewees

Name	Organization	Type
Ashok Das	Sun Moksha	Advisor
Madhavan Nampoorthri	ReSolve Consultant	Consultant
Sagar Gubbi	Ecoforge	Consultant
Sarvesh Kapoor	Intellecap	Consultant
Srikanth Pulavarthy	Intellecap	Consultant
Thomas Pullenkav	Independent Consultant	Consultant
Hardika	Kinara Capital	Debt Provider
R S Mani	IntelleGrow	Debt Provider
Vineeth Vijayaraghavan	Panchabuta	Government
Karthik Chandrashekaran	iAccelerator/First Light Ventures	Incubator
Kunal Upadhay	CIIE	Incubator
Saurabh Lahoti	Ennovent	Incubator
Srey Bairiganjan	NewVentures India	Incubator
Tej Dhami	Unltd	Incubator
Alipt Sharma	GEF	Investor
Nilanjan Ghose	GIZ	Donor
Santosh Singh	GIZ	Donor
Anjali Garg	IFC	Donor
Noshir Colah	Aavishkaar	Investor
Debasis Bhattacharya	Duron Energy	Social Enterprise
Michael MacHarg	Simpa Networks	Social Enterprise
N P Ramesh	Orb Energy	Social Enterprise
Nikhil Jaisinghani	MeraGao Power	Social Enterprise
Svati Bhogle	Sustaintech	Social Enterprise
VinayJaju	Onergy	Social Enterprise

5.2 List of Renewable Energy Enterprises

S.No	Organization	Launch Year
1	Adharam Energy	NA
2	All Green Energy India	2008
3	ApniBeejlee Energy Pvt. Ltd	NA
4	Applied Solar Technologies	2008
5	Avani Hydro	1997
6	Azure Power	2007
7	Bhaskar Solar	NA
8	Biotech	1994
9	Boond	2009
10	Ckinectics	2009
11	Claro Energy	2010
12	D.light	2007
13	DESI Power	1996
14	Duron Energy	2008
15	Envirofit	2011
16	First Energy	2007
17	Green Leaf Energy Pvt Ltd	2009
18	Greenlight Planet	2005
19	Greenway Grameen Infra	2010
20	Husk Power Systems	2008
21	InteliZON	2007
22	KotakUrja	1997
23	MeraGao Power	2010
24	MindaNexGen Tech	2011
25	Naturetech Infrastructure Private Limited	2011
26	Nest Energy	1998
27	Nuru Light	2008
28	OMC power	NA
29	Onergy	2009
30	Orange Alternatives	1992
31	Orb Energy	2007
32	Prakruthi Hydro Labs	2006
33	Praktidesign	2008
34	Pushan Solar Energy	NA
35	Sakhi Retail Pvt. Ltd.	2009
36	SamuchitEnviro Tech Pvt. Ltd.	2005
37	Saran Renewable Energy Pvt. Ltd	2006
38	SBA Hydro	2001
39	SELCO	1995
40	Servals	2002

41	Simpa Networks	2010
42	SKG Sangha	1993
43	SunEdison	2003
44	Sustaintech	2009
45	Tata Power Solar	1989
46	Thrive Energy Technologies	2006
47	Urja Unlimited	2012
48	Vana Vidyut	2012
49	Vayu Grid	2010

5.3 Sector-Building Infrastructure/ Efforts for financing in the RESE space

Investee/ Grantee	Funder	RESE Focus	Purpose	INR Crore(USD mn)
Axis Bank Ltd	IFC	N	• Axis Bank will utilize the funding for investments in renewable energy companies and projects across the country.	192 (35)
SEWA Green	IFC	Y	• Under Hariyali project, IFC will provide a partial credit guarantee for a US$ 5mn loan that ICICI Bank is providing to SEWA-sponsored Grassroots Trading Network for Women (GTNW). • Loan will be utilized for on-lending to SEWA members to purchase the clean energy lanterns and cook stoves. • IFC is also advising GTNW on building a loan product line, setting up information systems and processes for managing loans, and on training staff to serve the low-income customer better.	9.6(1.75)
Tata Cleantech Capital Limited (TCCL)	IFC	N	• A joint venture between Tata Capital Limited and International Finance Corporation (IFC), TCCL will provide finance and advisory services to small and medium enterprises and large corporate that promote clean technology. • TCCL will focus on energy efficiency, renewable energy generation projects, such as wind power, small hydro power, solar power, bio-mass and waste treatment, water management projects and	6.9 (1.26)

			projects that aid carbon footprint reduction.	
PTC Financial	IFC	N	• IFC provided debt funding to PTC to increase investments in the renewable energy space in India.	274 (50)
IDFC Climate Change Loan	IFC	N	• IDFC will invest in climate change projects • IDFC will scale up its capacity to assess renewable energy/ energy efficiency projects in the solar energy sector.	412 (75)
Drishtee Development and Communication Ltd	Shell Foundation	Y	• Assam Stove Market Development and Social Marketing	0.49 (.09)
Envirofit International Ltd	Shell Foundation	Y	• Scale-up of commercial delivery of Improved Cook stoves	113 (22.7)
Gajam Group Limited	Shell Foundation	Y	• Dharma India 'last mile' Challenge	1.5 (0.27)
Self Employed Women's Association (SEWA)	Shell Foundation	Y	• Provision of Green Energy and Green Livelihoods	1.37 (0.25)
T Muniswamappa Trust	Shell Foundation	Y	• Consumer Awareness and Consumer Financing in India	0.95 (0.17)
First Light Ventures	Shell Foundation	Y	• Establishment of the First Light India Accelerator	6.59 (.13)
Husk Power Systems	Shell Foundation	Y	• Development of Husk Power University	1.27 (0.23)
IntelleCash Microfinance Network	Shell Foundation	Y	• Scaling up SME Credit Facility	1.37 (.25) + 1.56 (.285)