Synergy Potential of Financial and Energy Inclusion
–An Interdisciplinary Approach

– Vandana Gaur*
Assistant Professor, G L Bajaj Institute of Management and Research, Greater Noida
vandana.gaur23@gmail.com https://orcid.org/0000-0002-0281-1793

– Asif Akhtar
Assistant Professor, Department of Business Administration Aligarh Muslim University, Aligarh
asifakh@gmail.com

– Gireesh Tripathi
Director (Academics), Power Management Institute, Noida
gireeshtripathi@gmail.com https://orcid.org/0000-0003-1056-6844

ABSTRACT
Purpose: Natural resources are depleting at a faster pace and there is a need to search for other alternatives. Solar energy is one such alternative which is gaining momentum nowadays. Providing easy access to this energy with the support of financial services can create a synergy effect and hence contributes towards the interdisciplinary approach of financial and energy inclusion. This paper aims at exploring the synergy potential of financial and energy inclusion with special reference to PAYG SOLAR.

Design Methodology: Review Based Approach.

Findings: The study concludes that Financial inclusion and energy inclusion are interdependent and if tapped to the fullest then create high synergy. Provision of access to finance facilities for the population living under bottom of Pyramid (BoP) will contribute towards Energy inclusion and access towards basis needs of electricity can create a demand for finance.

Originality/Value: The study endeavours to study the scope of financial inclusion and energy inclusion interdependently.

KEYWORDS Financial Inclusion | Energy Inclusion | PAYG Solar | Synergy | Easy Access

*Corresponding Author

https://doi.org/10.18311/gjeis/2019
Volume-11 | Issue-1 | Jan-Mar, 2019 | Online ISSN : 0975-1432 | Print ISSN : 0975-153X
Frequency : Quarterly, Published Since : 2009

©2019-20 GJEIS Published by Scholastic Seed Inc. and Karam Society, New Delhi, India. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
Introduction

India is emerging as a global start up hub with many companies creating a demand for venture capital funding. An economy and its industrial sector get a boost when major investments are aligned with technology and global trends.

Lack of finance options is one of the major barrier of solar energy Industry i.e the consumer is deprived of any finance facility for the usage of energy and industries are also having a thrust for creating an innovative product which aligns with their business model and government model of sustainable energy for all.

The Global financial sector currently aims at continuous supply of innovative methods to provide financial services to people. Despite of the fact that technology adoption in financial industry is bridging the gap between accessibility and inaccessibility to financial services at reasonable cost, still there lies an untapped part of population that remains under banked.

In Energy sector the increasing global energy demand due to ascending greenhouse gas emissions, environmental issues at the local level, energy security concerns, rising oil prices, and international competition has become one of the serious concern of today. With the passage of time non renewable sources are depleting faster and therefore more focus is being put on sustainability. An urgent need for the environmentally sound resources under the nations own control has been arisen owing to national and international events. Renewable sources are posing as a boon for the world economy as fulfilling the growing energy need through conventional sources or non renewable sources is becoming quiet difficult and complex with the changing scenario.

This paper will focus on the interdisciplinary approach of how financial inclusion and energy inclusion are complementary to each other and this relationship creates a synergy by opening new ventures, ideas and business for the energy industries with special reference to PAY AS YOU GO SOLAR.

Financial Inclusion to Energy Inclusion

According to Asian Development Bank , About 90% of poor households lack access to institutional financial services. Financial institutions do not provide them services due to their perceived high risk, high transaction cost as these transactions are small in nature and these households cannot provide any security as collateral against their loans. Easy access to credit helps them in managing the risk, increase their income and have a balanced economic life.

The purpose of financial Inclusion is to provide easy access to financial services at affordable costs to all individuals and businesses, irrespective of their net worth and size while Energy inclusion aims at providing reliable and affordable energy services to cover the basic energy needs of households and small to medium-sized enterprise’s. MSMEs are the dominant stakeholders in the current economic scenario and there is high synergy potential between the financial service providers and energy consumers. Financial inclusion leads to energy inclusion. If consumers have an easy access to finance then they can pay for their minimum energy needs or grid-supplied electricity or they have also the option to purchase their own distributed energy generation system. Purchasing an electricity generation systems demands huge investment, the burden of which cannot be laid upon on the consumers. Innovation in green credit enables clients to pay for their monthly installments according to their current expenditures on energy appliances, potential savings and income generation opportunities.

Energy inclusion leads to financial inclusion. Consumers of energy when provided with an option...
of small repayments to retailers or intermediaries for purchasing a distributed energy system will lead to financial inclusion through energy inclusion. Population living at Bottom of the pyramid can use the energy generated in increasing their productive capacities and repay the principal amount with a payback period of two to three years. This will help them in increasing their credibility through showcasing their repayment ability and accumulate collateral which are required to join a formal institution.

People who have an easy access to solar systems can distribute their electricity to others in return of some fees. This shows that there is huge untapped potential for energy inclusion. Financial inclusion provides a profit reaping environment for distributed energy solutions, especially for those living at the BoP.

The interdisciplinary approach of energy and financial inclusion provides an opportunity to the peoples living at bottom of the pyramid (BoP) to have their own electrification system and have access to financial services to finance their expenses. Also it gives an opportunity to MSMEs to reach their target markets and creating more business through various revenue models like community based distributor network and hence creating a synergy between the two concepts.

According to World energy outlook, 2012 a Global Findex database, 2012 around 1.6 billion people don’t have access to both financial and modern energy.

**Pay as you go- A driver of financial inclusion**

Businesses opting for Pay- as- you- go (PAYG) solar provide solar energy to the household sector with a payment scheme formed keeping in eye, the budgets of bottom of the pyramid customers. When these customers are given a facility of payment in instalments, they become the consumer of clean and safe energy which serves as a better option for them as these poor peoples don’t have access to grid electricity. PAYG solar are integrated with mobile money i.e consumers in rural areas can pay for their electricity through mobile money. This creates a scope for PAYG solar to act as a driver of financial inclusion through mobile money adoption.

Mobile money helps PAYG solar providers in making digital collection of funds from customers. PAYG solar helps the customer in buying a small solar home system with a small down payment and pay the rest over upon an agreed period using their preferred mobile money service and use the electricity as and when needed. PAYG providers are driving mobile money penetration and usage, increasing brand loyalty, and contributing to revenues.

**PAYG Process**

PAYG solar is an innovative technology in off-grid and decentralized solar power. It can deliver electricity to places where people can pay for their electricity in small increments using the mobile phone’s short messaging service.

The technology comprises of a solar home system (SHS) and a prepaid meter. The components of an SHS are a module, a battery, a charge regulator, and small light-emitting diode lamps. The metering device or controller locks the energy flowing out of the battery connected to the SHS. The consumer can unlock the controller according to his needs by purchasing energy credits through a simple recharge process using short messaging service on a mobile phone. The controller is a small electronic device in which data can be feeded through a keypad and has a simple liquid crystal display which shows the energy credit balance available for use by the consumer.
How Pay As you Go works

How Pay as you go lets understand with an example

Cost of Solar Home system = Rs.12000-14000

This system will comprise of a solar panel, a battery, a charge controller, lighting points, a mobile phone charging port, and power for charging.

Since people living in the rural areas cannot buy this SHS at one go so the company say XYZ ltd will allow the customer to purchase it on instalment basis

Down payment varies from 10%–30% of solar home systems

Once the payment made, installation is done on the customer’s premises mainly on the roof of the house. Through short messaging service of mobile phone, the customer can choose how much energy credit he wants to purchase according to his requirement which can be as low as Rs50. Consumer can use a part of the payment received for repayment of the capital cost of the Solar home system, and the remaining goes to XYZ ltd as profit to cover operational costs. Greater the recharge amount greater will be the proportion of the amount, the consumer can allocate for repayment of the capital cost of the SHS. After the full payment is made by the consumer over a period of time, the system unlocks permanently and can be used to produce electricity for free, and the consumer becomes the owner of Solar home system.

The Interdisciplinary Approach

In urban areas people use mobile wallet applications for the payment of utility services. However, this trend is not prevalent in rural areas. PayG solar providers push the usage of mobile services in these areas by providing customers a choice to use mobile money account of their interest.

The Synergy

Solar Home systems

Achieving the goal of energy inclusion goal depends on how private organisations respond to the demand for renewable energy systems. This creates a need for creating a collaboration between energy system suppliers and financial services providers. Due to this appropriate and affordable technology can be provided to population living at the Bottom of pyramid. The sustainable energy for all can be achieved only if financial inclusion aim at the population living at the BoP and provide them the opportunity of having the means and ability to take control of their own electrification which will increase their income-generating capacity and hence help them to get rid of the poverty trap.

Payg solar helps the companies in creating a direct link with their customers and allows up-selling and cross selling of various products to the same customer to help them climb the energy staircase.

PAYGO Provider and Microfinance Institution

The parternship if established between the provider of paygo services and Microfinance institutions who can easily provide credit facilities can potentially benefit millions of people. Microcredit has a positive impact on the lives of people. According to a study which covered eight countries including India, researchers found that in one country microcredit borrowers experienced a large increased in income. These studies support the fact that microcredit facilities does not contribute
much in increasing the aggregate income or long
term consumption but it helps the borrowers in
managing the risks by improving their ability
towards smooth consumption and retaining assets.
Hence Microfinance institutions through energy
inclusion models like PAYGO SOLAR can benefit
the poor people and provide them access to Energy
services at affordable prices.

**Globalised Economic activities**

Globalisation has led towards integration of
economic activities which has increased manifold
the demand of energy across the world. Financial
inclusions effect on energy inclusion can be
explained in the context of two different opinions.
Firstly, financial sector of our country is changing
very rapidly and these changes are contributing
towards increase in the purchasing power of the
people. This increase in the purchasing power is
utilised by them towards energy intensive products
and services like PAYG SOLAR. Secondly, an
escalating financial system helps in allowing more
credits to the renewable energy sector and encourage
people to invest more in high class energy efficient
product and services due to high affordability.

**Foreign Direct Investment**

According to World bank ,Financial Inclusion
is identified as one of the key enabler of Goal 7
(Affordable and clean energy) of the UN Sustainable
Development goals 2015. Foreign Direct investment
in the renewable energy sector can lead to higher
market penetration of energy efficient production
technologies. Due to increased penetration there
will be increased competition between the domestic
players to increase their investment and innovate
more to fight with the competition at the global front.
Increased FDI contribute also towards encouraging
technologically backward classes to employ energy
efficient techniques of production and consumption
through modernized financial machinery.

**Conclusion**

Access to Energy is the need of the hour as today
we talk about creating new milestone in electricity
generation but put very little efforts in

Making that energy accessible by everyone. Financial
inclusion helps in fulfilling the objectives of
Energy inclusion through various financial models.
Need for increasing energy inclusion demands from
the financial sector, creation of more innovation
financial models which can help in easy access
to credit facilities. Hence both are interdependent.

Payg Solar is a technology which is at its nascent
stage in India but opted by other countries like south
Africa, Nigeria, Uganda and have a very successful
implication. India is also in the process of using this
technology through simpa networks. The synergy
potential of energy and finance is too high as both
are complementary to each other.

**References**

- ADB,(2013), Affordable Pay-As-You-Go solar power
  for India’s Poor Energy Homes, Issue 48
- Sebastian Groh,(2013), The synergy potential
  of Financial and Energy Inclusion, CFI Blog
  centerforfinancialinclusion.org/blog.
- Simpa networks: Making solar power affordable in
  simpa.
- www.powerforall.org, https://medium.com/energy-
  access-india/distributed-solar-industry-sets-sights-
  on-india-as-next-pay-as-you-go-giant-1d63171eb745
- www.chamsaccess.com
- Repository.eclac.org
- Inspenonline.com

**Blind Reviewers Comment**

The manuscript is written nicely as it is focusing on upcoming technology PAYG Solar and how this technology help the peoples living at bottom of pyramid to pay for their electricity expenses. The manuscripts opens up new research ideas and tries to create a linkage between communication, Energy and finance. How these sectors together can create a synergy and contribute towards the lives of Underprivileged sections of the society and also towards the Indian economy. Overall the manuscript is focusing on new concept which can used for further research.
GJEIS Prevent Plagiarism in Publication

The Editorial Board had used the turnitin plagiarism [http://www.turnitin.com] tool to check the originality and further affixed the similarity index which is 16% in this case (See Annexure-I). Thus the reviewers and editors are of view to find it suitable to publish in this Volume-11, Issue-1, Jan-Mar, 2019.

Annexure 1

<table>
<thead>
<tr>
<th>ORIGINALITY REPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>16% SIMILARITY INDEX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRIMARY SOURCES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>adb.org</td>
</tr>
<tr>
<td>2</td>
<td>cfi-blog.org</td>
</tr>
<tr>
<td>3</td>
<td><a href="http://www.powerforall.org">www.powerforall.org</a></td>
</tr>
<tr>
<td>4</td>
<td><a href="http://www.adb.org">www.adb.org</a></td>
</tr>
<tr>
<td>5</td>
<td>arguendo.co.in</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6</th>
<th>Narendra Singh, Mukul Gupta, Saroj Kumar Dash. “A study on impact of key factors affecting buying behaviour of residential apartments: a case study of Noida and Greater Noida”, International Journal of Indian Culture and Business Management, 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>wsparrow.blogspot.com</td>
</tr>
</tbody>
</table>

Citation

Vandana Gaur, Asif Akhtar and Gireesh Tripathi

"Synergy Potential of Financial and Energy Inclusion – An Interdisciplinary Approach"


https://doi.org/10.18311/gjeis/2019

Volume-11, Issue-1, Jan-Mar, 2019

Online ISSN : 0975-1432, Print ISSN : 0975-153X

Frequency : Quarterly, Published Since : 2009

Google Citations: Since 2009

H-Index = 96

i10-Index: 964

Source: https://scholar.google.co.in/citations?user=S47TtNkAAAAJ&hl=en

Conflict of Interest: Author of a Paper had no conflict neither financially nor academically.