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Evaluating the Economic and Equity Impacts of a Decentralized Rural Electrification Program in India

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Abstract Access to affordable energy for millions of people in rural India has always been a challenge. Affordable and reliable electricity is fundamental to reducing poverty, increasing productivity, income and economic opportunities, and improving health and education. Energy is a significant factor for overall development of a society. The lack of access to electricity hinders any such developments. The paper describes the framework of an evaluation that uses an equity lens to assess the outcomes of a Rockefeller Foundation-supported program to promote access of poor rural communities in different regions of India to affordable and renewal energy. The impact evaluation uses a pretest-posttest comparison group design with difference-in-difference analysis strengthened through a mixed-methods approach that complements the statistical analysis with qualitative techniques such as focus groups and case studies. The program, Smart Power for Environmentally-sound Economic Development (SPEED), aims to address the basic needs of those who lack access to electricity and to spur economic development for the rural poor. The proposed design efficiently assessed the effect of rural electrification on the quality of life of rural communities along with key economic growth indicators. It has a strong focus on assessment of equity aspects which is a key consideration in SPEED imperatives. The design also provides for pointers towards the ability of the SPEED business model to achieve sustainability, replicability and scalability have also been discussed.

Key Words: Equity, Poverty, Renewable Energy, Economic Development, Rural India

INTRODUCTION

Access to affordable and reliable electricity is fundamental to reducing poverty, increasing productivity, income and economic opportunities, and improving health and education (World Energy Outlook, 2011). About 1.3

billion people or one-fifth of the world population lack access to electricity: of whom 628 million live in Asia and 590 million in Africa (World Energy Outlook, 2012). In India, more than 290 million people do not have access to the energy needed for lighting, income generation activities, mechanical power, transport or technology, with the majority living in rural areas (Deshmukh et al. 2013). A lack of electricity also contributes to safety of communities and inequity by often burdening women with physically taxing activities in collecting biofuel (Integrated Research and Action for Development and Energia: International Network on Gender and Sustainable Energy, 2009).

Despite progress in rural electrification in India, millions of homes remain unelectrified due to the challenges of extending the grid to inaccessible rural areas, high cost of distribution and infrastructure development, high transmission and distribution losses, limited implementing and maintenance capacity, and electricity generation shortage (Deloitt, 2013 & Crousillat et al. 2010). As urbanization and industrialization continue to grow, power will be drawn to urban and industrial estates – widening disparities and inequitable economic growth between these areas and poor rural communities. It is in this context that small scale decentralized electricity generation based on renewable energy micro-grids offer greater opportunities for providing access to remote areas as well as electrified areas where the power supply is inadequate to meet the needs of small businesses as well as domestic and community services such as school and health centers.

Review of literature on evaluation of Rural Energy initiatives for measuring impacts and establishing the counterfactual reflect on wide range of methods and indicators adopted. These range from quasi-experimental designs like difference in difference and regression discontinuity (IFPRI, 2013), instrumental variables (Khandekar et al. 2012; Peters, Sievert, & Vance, 2009) to cross-sectional with-without comparison (EnPoGen, 2003, EnPoGen, 2003a, ESMAP, 2003 and World Bank, 2006)) and theory of change approaches. Each of the methods has its own issues and challenges in implementation. Forte (2011) gives a comprehensive literature review of various approaches and describes the use of logic models and theory of change. Peters (2009) also provided a similar review and proposes the ex-ante approach.

As regards indicators measured the focus is on sustainability indicators in line with the concept of sustainability specifically applied to energy development describing impacts in economic, social and environmental dimensions (OECD/IEA, 2001). Ilskog (2008) builds on the concept as technical, economic, social/ethical, environmental and organization/institutional sustainability. Energy poverty and energy poverty

line also gets mentioned as a key dimension (Pachari and Spreng, 2004; Barnes, Khandekar and Samad, 2010).

However, Reiche et al. (2000) talked about 'project specific' indicators in the thematic domain of domestic, productive, and public uses in addition to sustainable development indicators based on specific thematic focus of the projects.

Given the distinction in terms of objectives and context, evaluation necessitates customized evaluation designs based on the project specifics. Thus evaluation of a given project requires adoption of best-fit methods and indicators responding to the intervention logic articulated as its theory of change. While doing so, need for rigorous evidence to establish the counterfactual also needs to be a key concern. This paper is a case-study demonstrating a comprehensive approach for the same.

THE SPEED PROJECT

The Rockefeller Foundation-supported Smart Power for Environmentally-sound Economic Development (SPEED) initiative aims to address the basic needs of vulnerable people who lack access to electricity and to spur economic development for the rural poor. As an initiative in the development phase, the Foundation and its SPEED partners aim to demonstrate commercially viable business models of decentralized renewable energy projects and learn about the scalable pathways for delivering affordable, reliable and clean energy to large numbers of poor and vulnerable rural communities to improve their quality of life and enhance their economic development.

SPEED aims to promote inclusive business models and equitable growth to address the energy needs of the rural poor. The potential impact of SPEED relates not just to creating jobs but to transforming economic systems to yield expanded income security, including:

- Establishment of new businesses that generate demand for off-farm jobs for young people
- Development of supply chain linkages that will directly benefit surrounding communities
- Creation of new enterprises for value-added processing in agriculture, as well as new off-farm rural employment opportunities
- Productivity gains in existing activities (e.g. more effective irrigation, better storage facilities for produce, longer working/retail hours, etc.)
- Significant cost savings for families, particularly for irrigation, which can be reinvested in businesses and/or improve well-being

To do this, the Rockefeller Foundation and its ten partner organizations have developed a Theory of Change and a set of testable assumptions about the processes through which the SPEED model is intended to achieve its objectives. SPEED is working to identify business models and support and test scalable pilots of decentralized renewable energy mini-grids that capitalize on the energy needs of fast-growing "anchor-load[1]" clients such as telecom towers to make it bankable and economically viable for Energy Service Companies (ESCOs) to provide a regular supply of renewable power to small businesses, farmers and domestic users in rural communities. The core strategies of SPEED's work are to improve the quality of life for low-income rural communities through:

- Incentivizing energy service companies (ESCOs) to provide electricity to both commercial and domestic rural consumers through the adoption of commercially viable business models
- Creating an enabling policy environment and generating industry support
- Developing financing models to attract capital to invest in ESCOs
- Supporting platforms for networking and knowledge sharing in India and across the globe

SPEED LEARNING, MONITORING AND EVALUATION (L, M & E)

Since the aim of SPEED is to learn through piloting and documenting scalable pathways during the two-year development phase, the Foundation and its SPEED partners has designed an approach that encompasses three components: learning, monitoring and evaluation. Ten learning questions were developed based on the Theory of Change at the onset of the program. For example: 1). Does SPEED addresses the needs and challenges facing Energy Service Companies (ESCOs) and telecom companies, and how have they participated? 2). Do SPEED ESCOs attract investment and what interventions are required to ensure that financiers (patient and commercial capital) invest in SPEED affiliated ESCOs? These guide the Foundation, the LM&E partner and other SPEED partners in collecting evidence and analyzing key success factors, challenges, risk and uncertainties which are synthesized and utilized in strategy shaping and effective decision-making around the future deployment of the Foundation's resources. The learning questions were framed with the following learning goals:

[1]Anchor load is a fixed amount of power that a utility company must supply to its customers. The basic criteria for considering an entity as anchor load is its ability to consume 20-30% of power from a decentralized renewable energy power plant daily, have the ability to generate aggregated long term power purchase agreements in multiple locations or sites to support bankability and viability of the power plant, and have the capacity to scale.

- Monitor, test and build knowledge around the viability of the theory of change, in particular the core assumptions about how outputs lead to outcomes, and how outcomes will lead to impact and scale to achieve the initiative goal
- Build knowledge around the external context, including emerging innovative opportunities, what has worked and what hasn't, what others know, and the Foundation's positioning and influence
- Monitor major risks and uncertainties

The SPEED Learning, Monitoring and Evaluation have three main purposes:

1. Learning: to improve the design of the initiative and gather evidence and data on the key learning questions that will help the Rockefeller Foundation and partners decide how and if SPEED can be scaled up.
2. Accountability to the Rockefeller Foundation President and Board of Trustees and other key stakeholders through the provision of credible evidence to inform investment decisions on the relevance and rationale of the initiative for achieving development outcomes in India.
3. As a public good, contributing knowledge on approaches, methods and tools for evaluating programs to the fields of decentralized renewable energy, philanthropy, and development evaluation.

DEFINING EQUITY AND ITS IMPLICATIONS FOR SPEED

Equity has to do with fairness. While *equality* is concerned with equality of outcomes (e.g. do all households receive the same access to domestic power, do all businesses in the community have equal access to electricity, and do all families benefit once the community has power); *equity* compares equality of outcomes with equality of opportunity. An equity perspective recognizes that differences in outcomes may be due to: choice (some people prefer a less stressful job that pays less or they prefer more leisure), unavoidable factors (there is a drought that reduces farm income), or inequality of opportunity (e.g. poorer farmers may not be able to afford to pay for power-driven irrigation pumps). Inequity is concerned with avoidable reasons for differences in outcomes. While the concept of choice or unavoidable factors is theoretically clear, in practice they may be difficult to interpret. For example, while a drought may be considered unavoidable, it may have more severe consequences for poor farmers who cannot afford to build water storage facilities or to purchase a pump. So there are two main elements of equity analysis: first, measuring the level of inequality of outcomes and second, determining the extent to which these were due to free choice, to unavoidable factors or to inequality of opportunity.

The inequitable distribution of electricity between urban and rural areas is likely to contribute to the widening of income inequality between urban and

rural areas, and between richer and poorer states. Rural electrification may also affect income equality, positively or negatively within a community. In India, states such as Gujarat, Tamil Nadu, and Punjab, with higher level of per capita gross domestic product (GDP) have more electrified villages, when compared to Bihar and Jharkhand that have lower per capita GDP. SPEED aims to promote equitable growth, where a lack of equitable infrastructure prevents poor people from leveraging economic development opportunities. In a context where agricultural growth rates are limited by technology and environmental constraints, providing power that enables rural communities to enhance productivity and new off-farm income growth increases the possibility that poor communities can achieve economic growth rates above the national average.

Since decentralized renewable energy projects in rural areas are nascent and uncoordinated, energy service companies (ESCOs) and investors are reluctant to invest in these projects. The Rockefeller Foundation and partners are demonstrating commercially viable business models of decentralized renewable energy projects to attract investors and companies to invest in rural area. The initiative is designed to pilot and learn from strategies that promote inclusive business models and equitable growth to address the energy needs of the rural poor. At the project selection level, to ensure that ESCOs do not only select better-off communities and communities with high demand for electricity, SPEED has adopted the cluster approach where villages with less electricity demand and fewer customers are combined with villages with high electrification demand and large number of customers. At the broader strategic level, the program is designed to ensure that the process of scaling up the program to reach large numbers (thousands) of villages, will lead to equitable growth, reducing economic and social inequalities between urban and rural areas.

The challenge for the evaluation design is to assess the extent to which SPEED does contribute to both economic growth and increased equity at the community, project selection and macro levels. As SPEED is still in the development stage, where the primary goal is to work with ESCOs to test viable business models for providing power to remote rural communities, it is not realistic in the short-run to require ESCOs to focus on providing equitable access to power for all households within the community. However, once ESCOs are convinced of the technical and financial viability of the approach, the SPEED strategy is to work with them to steadily increase the number of businesses and households within each community with access to a reliable power supply. During this expansion phase, it will become important to assess the equity outcomes of access to power. Consequently the initial phase of the evaluation will seek to identify simple indicators of the benefits of the project to community residents (such as residents' feeling of comfort or small

improvements in the quality of life). However, the evaluation framework is designed to be able to apply more rigorous measures of equity if the SPEED model proves successful and moves to the expansion phase.

THE EVALUATION FRAMEWORK

Looking at the overall aim of SPEED the evaluation framework needs to address the following two broad questions:

- How can equitable growth be measured and SPEED's impact on equitable growth evaluated?
- How can SPEED's agenda of promoting inclusive business models be assessed?

The first challenge was to contextualize equitable growth and access with respect to SPEED. The second challenge was to devise mechanisms through which evaluation can be disaggregated down to the level of a "village" and "cluster" as every village/cluster within the ambit of SPEED is developed as a unique entity. SPEED at a macro level is a bouquet of several small projects, bundled in clusters of six to seven projects, erected at different geographical locations using different technologies (viz. Solar, Biomass, hybrid, etc.), different community partners, and different sources of investments, etc. The catchment area of a typical project is usually a 'village' with around 500 households. Every 'village' should eventually turn out to be a sustainable model ready for replication and scale-up. To develop a business case and to ensure investment readiness, SPEED within its business construct, also promotes a group of 'village' in a geographical proximity as a cluster. A cluster is usually anchored by the same ESCO and the community partner. Hence, the two key metrics considered for SPEED evaluation are presented below in Figure 1:

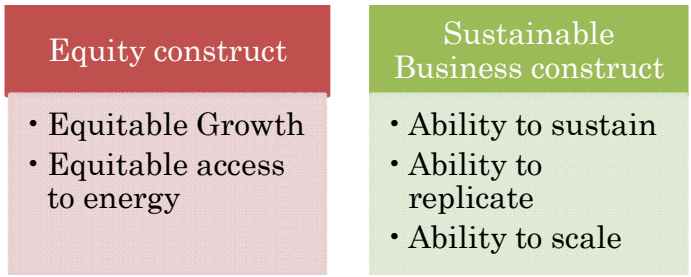


Figure 1: The SPEED Equity and Sustainable Business Constructs

The third challenge was to make the evaluation design flexible enough to work in tandem with the program implementation design. Projects within SPEED are staggered with respect to their implementation plan (i.e. time of start). The evaluation design addresses this challenge by conducting the

baseline just before implementation is to start at a particular site or a cluster of sites. The end term evaluation is also planned to be conducted in a staggered manner.

EVALUATION BUILDING BLOCKS

The first building block for the evaluation design is SPEED's theory of change. The theory of change, developed through a consultative and iterative process, identifies key program outcomes to be measured by the evaluation. While the outcomes become the loci of evaluation, results are monitored through concurrent processes at different levels of interventions. Figure 2 provides an overview of the Theory of Change also identifying the key evaluation parameters.

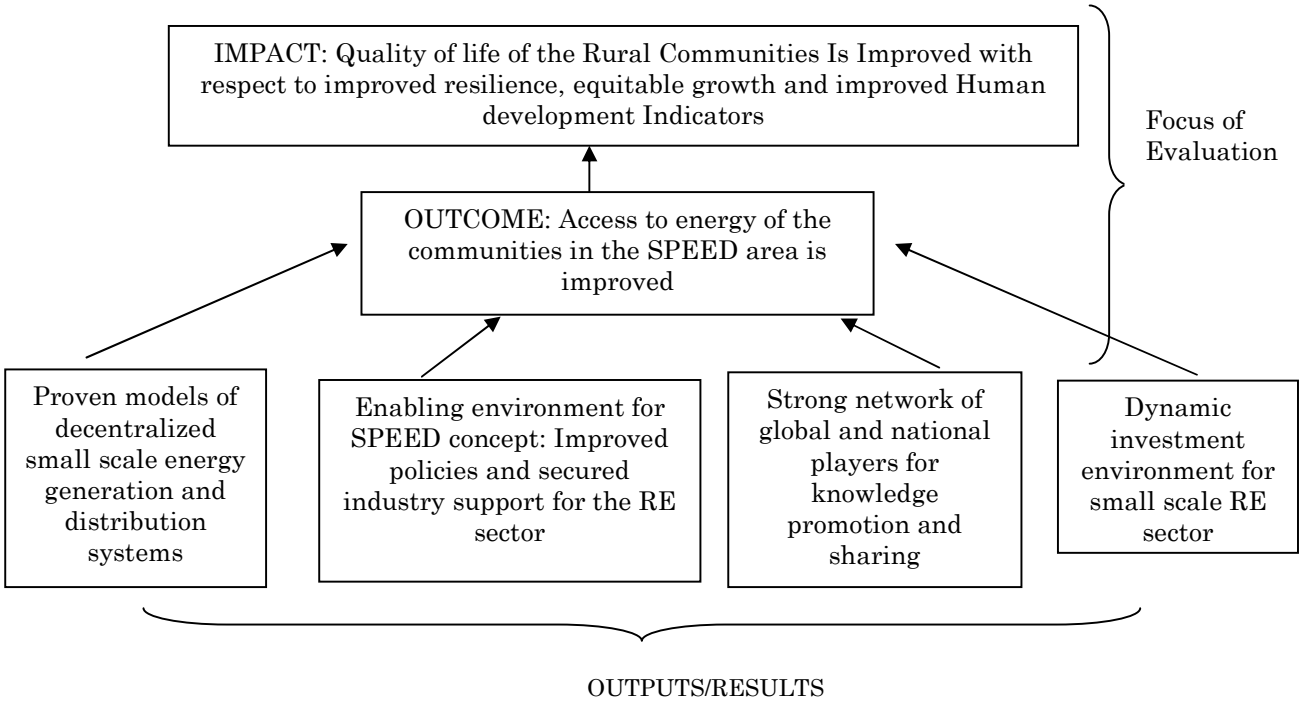


Figure 2: The SPEED Theory of Change

The theory of change further deconstructs impacts and outcomes by providing their contextual definitions and also identifying their indicators and responding to equity measurement at the community level.

TABLE 1
DEFINING THE LEVELS OF EVALUATION

Indicator	Description
Quality of life of the rural communities is improved	The long-term impact that SPEED envisions will contribute to improved quality of life. Quality of life in the context of SPEED encompasses three constituents: a. Equitable Growth: Poor and Vulnerable achieve tangible economic benefits b. Improved human development outcomes: for bottom 25% with respect to education, health and nutrition c. Increased resilience: Increased choices and ability to adapt.
Access to energy by the communities	The core problem SPEED addresses is of 'access to energy' of the poor and vulnerable populations. SPEED is designed for enhancing access to energy/clean energy of this targeted populace in the project target area.
Results	For reasons of space, the four short term outcomes (proven models of decentralized, small-scale energy generation, enabling environment for SPEED concept etc) are not described here

The other building block of evaluation is the measurement of equity at the project level. This is guided by measuring the project's intention of reaching as broad a sector of the target community population as possible. The third and last building block of the evaluation is at the strategic level. At this level the evaluation is designed to assess the sustainable business construct of SPEED on the parameters of sustainability, replicability and scalability. These are essentially measured against the project deliverables i.e. the results, as mentioned in the ToC diagram.

THE DESIGN

The evaluation has adopted a quasi-experimental pretest-posttest mixed methods design. Every project within SPEED has to undergo a baseline assessment followed by an evaluation at the end of the third year of its implementation. A dipstick (sometimes called a "dashboard") assessment of key project outputs/results is also done after a year of project implementation. If funds permit, in the fourth year of implementation i.e. a year after the Foundation withdraws the support; a post project evaluation may be conducted.

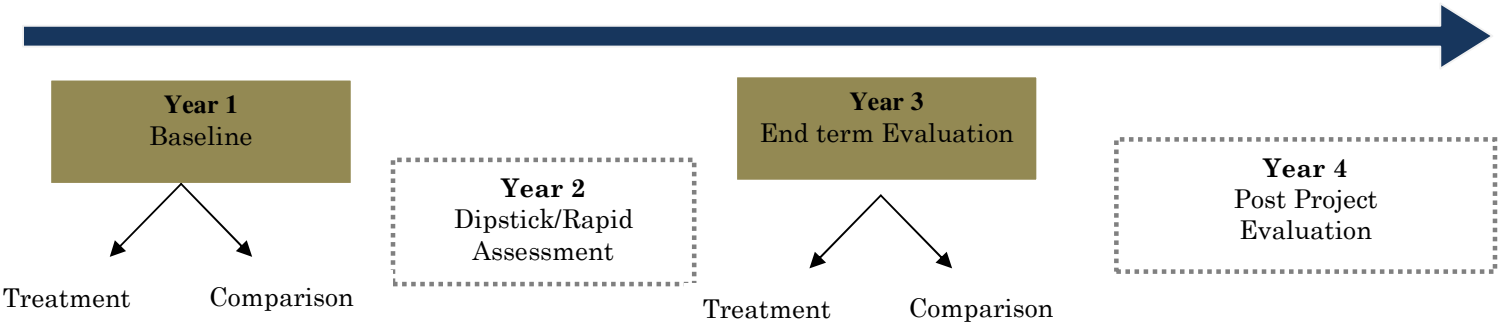


Figure 3: The Time-line for the Impact Evaluation

The design recognizes the fact that impact level indicators will have a long gestation period and hence it will not be possible to quantify most, if any of the long-term impact indicators at the end of the third year. For the third year measurement, the design intends to deconstruct the complex indicators viz. quality of life into sub-indicators (for example, access to electricity or reduced eye irritation when kerosene lamps are replaced) and then assess the change from the baseline and the difference with respect to the comparison areas.

BASELINE AND END TERM

In order to collect data to measure the outcome indicators, the design for baseline and end-of-project surveys include the following methods:

Household Survey

This entails conducting a household survey covering primary indicators on economic well being, quality of life and access to electricity.

Both treatment and comparison population are covered by the survey. Comparison areas are selected through a priori matching based on socio-demographic parameters: social composition, distance from district/block headquarters, grid/off grid, etc. At the first stage, a list of all the intervention villages is collected along with secondary data on socio-demographic parameters. The intervention villages are matched to similar villages in the proximity.

It is imperative for the sample size to be powered enough to provide a robust analysis at the level of a cluster and also a plant catchment area i.e. project. To ensure this a minimum of 150 households are surveyed at a plant level while at the cluster level a minimum of 750 households are covered. The same sample sizes are used in the comparison areas (Table 2).

TABLE 2
PROPOSED SAMPLE SIZES FOR THE PROJECT AND COMPARISON GROUPS

Level	Sample Size	Qualification
Cluster	750 (150 per plant)	MDI (Minimum Detectable Impact) of 5 %, 95% confidence level and 80% power.
Plant	150	95% confidence level with an error of plus or minus 0.04% at a plant level.

The household survey tool is administered to selected sample of households in both treatment and comparison areas.

Enumeration of Energy Consumption

This entails enumerating all the households and enterprises in the village on their present energy consumption pattern. As one of the facets of access to energy, a village and enterprise enumeration survey estimates the magnitude of energy by type of energy (renewable vis-à-vis non renewable) consumed for a project catchment.

Focus Group Discussions

Focus group discussions are designed to provide an in-depth qualitative interpretation of the findings. Discussions are conducted at the community level, with separate groups of women and men, both selected to be broadly representative of the community to gain qualitative insights into indicators indentified on the parameters of relevance, efficiency, sustainability and impact

Case Studies

Renewable energy based micro-enterprise development is one of the key focus areas of SPEED. This entails developing sustainable enterprises in the project catchment drawing power from the SPEED plant. Typical micro enterprise at the village includes rice mill, *kirana* shop, tailoring shop, etc.

Case studies are being developed for a representative sample of enterprises and also few households in the treatment and comparison villages to draw the pathway of change during the project period. Each case study involves at least three rounds of in-depth interviews with the selected enterprise and household: one set during baseline, another during Year II and a third set in the third year of implementation i.e. during the end term.

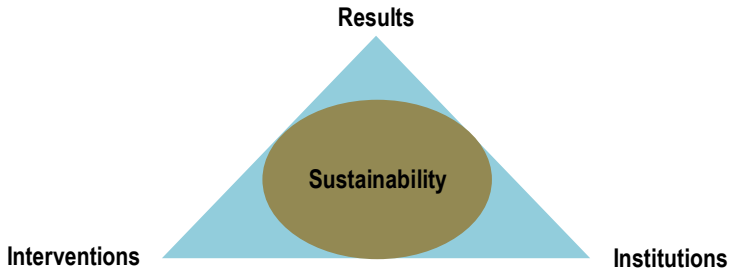
ESCO, Partner Level Consultations and Assessment of Secondary Data

With respect to the sustainable business construct, the evaluation design combines community level data with consultations at the level of ESCO and SPEED partners (viz. Community partners, SPEED core partners, DFIs, etc.) to assess business potential and evidence of replication and scaling-up. These consultations are a part of SPEED learning activity which engages the SPEED monitoring, learning and evaluation partner to conduct consultations and learning forums twice every year. Feedback from these consultations is combined with on-the-ground evidence of replication and scale.

POST PROJECT ASSESSMENT

If resources permit, a post-project survey will be conducted in the fourth year of implementation i.e. after SPEED withdraws, to assess project sustainability which is defined in terms of the following three dimensions:

Figure 4: Dimensions of the Post-project Assessment



Dimension 1: Sustainability of Interventions i.e. electricity generation, supply management, operations and maintenance, etc.

Dimension 2: Sustainability of Institutions created or supported by the Program. During the course of its intervention SPEED creates village level institutions viz. micro-enterprises, self-help groups, etc. At the macro level it has created financing support vehicles like catalytic facility, etc. This dimension of assessment will assess how the institutions created by SPEED measured on sustainability after the present phase of intervention is over.

Dimension 3: Sustainability of outcomes/results: Sustainability of outcomes/results can be better assessed during post-facto assessments adopting a methodology similar to the end of project evaluation. Assessment of sustainability of interventions and institutions will be done using a mix of quantitative and qualitative methods combining primary and available secondary data.

ANALYSIS PARADIGM

In terms of assessing outcomes, Difference in Difference (DID) and Propensity Score Matching (PSM) will be used across baseline, end-term and post project assessment. Difference-in-differences (DID) estimators will be computed on one or more of the "quality of life" indicators by creating dummy variables for treatment and test period ("post") to conceptualize a regression equation as described below:

$Y_i = \beta_0 + \beta_1 treatment_i + \beta_2 post_i + \beta_3 treatment_i * post_i + e_i$

Wherein "post" is a dummy variable, which =1 for endline, and =0 for before-treatment and "treatment" is a second dummy variable, which =1 if individual is in treatment block (having access to energy) and =0 if the individual is not. Based on the above regression equation the difference in difference can be computed as β3 as described below (Table 3):

TABLE 3
DIFFERENCE IN DIFFERENCE ESTIMATOR

	SPEED Group	Non-SPEED Group	Difference
Before	$\beta_0 + \beta_1$	β_0	β_1
After	$\beta_0 + \beta_1 + \beta_2 + \beta_3$	$\beta_0 + \beta_2$	$\beta_1 + \beta_3$
Difference	$\beta_2 + \beta_3$	β_2	β_3

The estimate for β_3 will be the DID estimator. In order to complement the DID method, Propensity Score Matching (PSM) will be used during end term/post project assessment to compute the average treatment effect across treatment and comparison sites. This will use probit estimation to generate propensity score to compute Average Treatment Effect (ATE) using local linear regression matching and ensuring common support.

USING STANDARD MEASURES OF ASSESSING OUTCOMES

For the outcome level assessment the evaluation design builds in tools and methods which are widely accepted measures of quality of life and also economic well-being. Household income is one of the key measures, and the design incorporates several tools viz. Wealth Index, Livelihood Impact Monitoring and Evaluation System and the Multi Dimensional Poverty Index, These indices are being developed during the baseline and will be reassessed during end-term/post project evaluation. The details are as follows:

- **The Wealth Index** is a tool adapted from the Demographic and Health Survey (DHS) (http://www.measuredhs.com/topics/Wealth-Index.cfm) that uses information on thirty-three household assets and housing characteristics

and combines this information into a single wealth index, assigning weights to individual components.

- **Livelihood Impact Monitoring & Evaluation System (LIMES)**: LIMES is based on the sustainable livelihoods approach (SLA) (DFID, 1999). This is drawn from the fact that SLA integrates the main factors that affect poor people's livelihoods and the typical relationships between these factors. Closest to the people at the centre of the SLA framework are the resources and *livelihood assets/capitals* that they have access to and use. These livelihoods assets/capitals can be grouped under the following: Physical Capital, Social Capital, Financial Capital, Natural Capital, and Human Capital.

LIMES uses Principal Component Analysis (PCA) as the main statistical tool along with reliability analysis which measures correlation amongst a set of indicators identified in the context of the project on all the five capitals to shortlist, retain and categorize statistically relevant ones

- **SMPI**: SPEED Multidimensional Poverty Index (SMPI) is a tool adapted from UNDP's Multidimensional Poverty Index (UNDP, 2013) and contextualized to SPEED. It identifies multiple deprivations at the individual level in education, health and standard of living. The tool computes deprivation scores at an individual level. This score is based on his/her household deprivation on each of the component indicators viz. education, health, standard of living and security. The maximum deprivation score is 100 percent, which is weighed equally across the components. Thus each component weighs 20%. The indicators in each component are weighted equally. The following are the four components being considered in this evaluation:

- Education:
  - Having no household member who has completed five years of schooling.
- Health:
  - Having child member (12 to 23 months) who is malnourished.
- Standard of living:
  - Status of electrification
  - Not having access to clean drinking water
  - Not having access to adequate sanitation
  - Using unfit for health cooking fuel (dung, wood or charcoal)
- Sense of security and comfort due to electricity

USE OF EVALUATION

The Learning, Monitoring and Evaluation (LM&E) system of SPEED structures the monitoring of outcomes of SPEED's activities and provides a

framework for tracking ongoing developments, specific outputs and deliverables to ensure smooth implementation of project activities, impact, and effective documentation and learning. A key component of the system is an impact evaluation design that uses baseline data on project and comparison areas to assess social and economic changes that can be attributed to the effect of the project interventions. The LM&E of the SPEED initiative has three main purposes: learning, accountability and providing a public good.

To systematically learn, the Rockefeller Foundation and its partners set up a system to monitor and collect information and credible evidence based on the framework of the ToC and learning questions developed at the start of the program. In collaboration with SPEED partners, the system was designed to track early signals of changes in communities as well as the ecosystem of decentralized renewable energy sector, the change process and factors contributing to changes. This participatory approach creates a robust and collective learning process among partners and the Foundation, and contributes to strategy improvement by assessing program effectiveness and quality. Learning has been utilized to enhance grant making plans, for example, identifying new partnerships that help the Foundation learn more about the renewable energy technology, potential financing facilities and transferability of SPEED into new geographies. Learning also helps shape new approaches and engagement strategies that contribute to the acceleration of delivering results and achieving program goals.

In terms of accountability, learning from the program will be shared with the Foundation's President and Board of Trustees and other key stakeholders to make informed decisions about the direction of the initiative and whether to scale the program into a longer-term initiative.

Since the decentralized renewable energy market is still nascent and unstructured in most developing countries, learning from the pilots in India will significantly contribute knowledge to the emerging sector in India and other geographies. As a public good, learning from the program on business models, technology, policy and financing has been systematically documented, synthesized, and shared with key stakeholders including investors, financiers, energy service companies, academic research institutions, energy experts, bilateral organizations, governments, and telecom companies. Knowledge products, such as the SPEED Handbook for Potential Entrepreneurs, for those who seek to understand and/or invest in the rural decentralized renewable energy market are being produced. The Rockefeller Foundation and SPEED partners disseminate lessons from SPEED nationally and internationally and engage new actors to share best practices that promote the growth of the sector and facilitate the transition to

a clean energy economy. Finally, the innovative LM&E framework, methods and tools of monitoring and evaluating SPEED's business models are also being shared with the evaluation community as a contribution to development evaluation.

CONCLUSION

The goals of the Rockefeller Foundation funded SPEED program are to develop and test inclusive business models that promote equitable growth by providing renewable and affordable energy to poor rural communities and enterprises in India. The program includes a Learning, Monitoring and Evaluation (LM&E) component that both guides program implementation and produces learning products that help promote the expansion of the program within and outside India. The LM&E system includes an impact evaluation designed to: (1) assess the effectiveness of the program in promoting equitable economic development and improving the quality of life of poor rural communities, and (2) assess the effectiveness of the SPEED program in developing a sustainable, replicable and scalable business model that can make a significant contribution to reducing rural poverty through affordable and accessible energy.

The impact evaluation uses a pretest-posttest comparison group design that generates baseline data for all SPEED communities and comparison groups that are matched using propensity score matching, and repeats the measures after three years and then a year later (resources permitting) for a post-project assessment. The evaluation uses a difference-in-difference analysis which is strengthened through a mixed methods design in which the quantitative surveys are complemented by qualitative techniques including focus groups and case studies.

A key element of the evaluation is to assess the equity outcomes of the program at the macro level, the program level (how communities are selected for electrification), and at the project level (the distribution outcomes within the target communities). At the community level several instruments are used to assess program impacts on economic growth and the distribution of benefits. These include — a wealth index; a Livelihood Impact Monitoring and Evaluation System (LIMES) that assesses changes in social, financial, human, physical and natural capital; and a Multidimensional Poverty Index adapted from the UNDP MPI index.

The lessons from the monitoring and evaluation will be used by the Rockefeller Foundation in deciding on the future direction of the rural electrification initiative, and will also be translated into learning products

that will be shared with a wide range of private sector, government and civil society organizations inside and outside of India.

REFERENCES

Bamberger, M and Segone, M. (2011). How to Design and Manage Equity-focused Evaluations. New York: UNICEF http://mymande.org/sites/default/files/EWP5_Equity_focused_evaluations.pdf)

Barnes, D. F., Khandekar S. R., & Samad, H. A. (2010). Long-Term Impacts of Household Electrification in Rural India Policy Research Working Paper 5332 Development Research Group, The World Bank

Ckinetics (2012). SPEED Smart Power for Environmentally-sound Economic Development. Retrieved on 30/5/2013

Crousillat, Enrique, Richard Hamilton and Pedro Antmann (2010). Addressing the Electricity Access Gap. Background Paper for the World Bank Group Energy Sector Strategy

Deloitte. (2013). Securing Tomorrow's Energy Today: Policy and Regulations - Energy Access for the Poor. (www.deloitte.com/in)

Deshmukh, Ranjit, Juan Pablo Carvallo & Ashwin Gambhir (2013). Sustainable Development of Renewable Energy Mini-grids for Energy Access: A Framework for Policy Design. LBNL Report Number (LBNL -6222E) https://isswprod.lbl.gov/library/view-docs/private/output/rpt82612.PDF

Dominique van de Walle, Martin Ravallion, Vibhuti Mendiratta & Gayatri Koolwal (2013). Long-Term Impacts of Household Electrification in Rural India Policy Research Working Paper 6527.Development Research Group, The World Bank http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2013/06/28/000158349_20130628143734/Rendered/PDF/WPS6527.pdf

EnPoGen (2003). Energy, Poverty and Gender: Impacts of Rural Electrification on Poverty and Gender in Indonesia. World Bank, Washington, D. C.

EnPoGen (2003a). Energy, Poverty and Gender: Impacts of Rural Electrification on Poverty and Gender in Sri Lanka. World Bank, Washington, D. C.

ESMAP (2003). Rural Electrification and Development in the Philippines: Measuring the Social and Economic Benefits. ESMAP Report 255/03, World Bank, Washington, DC.

Forte, David (2011). Off-Grid Rural Electrification Projects: A Practical Approach to Evaluating Sustainability and Project Specific Outcomes. Master of Public Administration, University of Washington Daniel J. Evans School of Public Affairs (http://evans.washington.edu/students/forms-advising/degree-projects/archive/grid-rural-electrification-projects-practical-approach-evaluating-sustainabili-0 Retrieved on 30/5/2013

IFPRI (2013). http://www.ifpri.org/book-744/node/5375Retrieved on August 24, 2013

Ilskog, E. (2008).Indicators for Assessment of Rural Electrification–An Approach for the Comparison of Apples and Pears. *EnergyPolicy,36,*2665-°©-2673.

Integrated Research and Action for Development and Energia: International Network on Gender and Sustainable Energy (2009). Gender Analysis of Renewable Energy of India: Present Status, Issues, Approaches, and New Initiatives

International Energy Access (2011). Energy for All: Financing Access for the Poor
---------- (2012). World Energy Outlook Database
OECD/IEA (2001). Towards a Sustainable Energy Future. Paris, France
Pachauri, Shonali and Daniel Spreng (2004). Energy Use and Energy Access in Relation to Poverty. *Economic and Political Weekly*, Vol. 39 (3): pp.271-278.
Peters, J. (2009). Evaluating Rural Electrification Projects: Methodological Approaches. *Well-Being and Social Policy* 5 (2): 25-40.
Reiche,K., Covarrubias, A.,& Martinot, E.(2000). Expanding Electricity Access to remote Areas: Off Grid Rural Electrification in Developing Countries. In *WorldPower2000,* Guy Isherwood, ed. (London: Isherwood Production Ltd.),52-60.
Sustainable Livelihoods Guidance Sheets, DFID http://www.eldis.org/vfile/upload/1/document/0901/section2.pdf Retrieved on 30/5/2013
UNDP (2013). The Multidimensional Poverty Index (statistical table 5 of the 2013 Human Development Report). http://www.undp.org/content/undp/en/home/librarypage/hdr/human-development-report-2013/ Retrieved on 30/5/2013
http://www.measuredhs.com/topics/Wealth-Index.cfm Retrieved on 30/5/2013

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