

the **Lemelson** foundation
improving lives through invention

EXECUTIVE SUMMARY	2
PROJECT PROGRESS	2
PRODUCT AND SERVICE RELATED PROGRAMS	3
TECH & DESIGN TEAM	3
MICRO-GRIDS	3
SOLAR PUMP	4
ENERGY EFFICIENCY IN LIVELIHOOD	4
URBAN COMMUNITY LAB	5
INTEGRATED ENERGY CENTRES	7
RURAL LAB	7
SMALL SCALE AGRICULTURAL MACHINES	7
EDUCATION, OUTREACH, AND INSPIRATIONAL ACTIVITIES	7
EDUCATION LAB	8
A SUSTAINABLE SCIENCE LAB – MUTHUR GOVERNMENT HIGH SCHOOL	9
INTERNSHIP PROGRAM	10
RURAL SEC	10
TALKS AND EXHIBITIONS	10
POLICY	10
POLICY GROUP	11
KNOWLEDGE MANAGEMENT AND DOCUMENTATION	12
OPPORTUNITY CRITERIA CHECK-IN	12
SECONDARY CRITERIA	14
COMMUNICATION AND ADVOCACY	14
INVENTING GREEN	14
FUTURE PLANS	15

FINANCES	15
CHANGE IN PERSONNEL	15
PHOTOS	15

Executive Summary

INSERT CONTENT (300-500 words)

Project Progress

Briefly describe the progress made towards project goals, objectives and milestones. This section should comprise the majority of your report (approximately 1/3 of the total page length requirement).

We start with presenting a scorecard of our progress towards the milestones as set out in the grant agreement. We have tried to be as objective as possible, but given the intangible nature of some of the milestones, they would remain subjective to a certain extent. We elaborate later in the document (and in a separate sheet) our rationale for arriving at the results.

Program	Metrics	Targets	End year Actuals
Product Innovation	- Number of technical products worked on	2	
	- Number of products taken to market	1	
	- No of Business innovations introduced	1	
Technical Testing and Evaluation	- State of Market reports	1	
	- Corporate relationships	1	
Community Organizations	- Organizations worked with	3	
	- Products introduced	1	
University and student relationship	- Capacity Building with students	750	
	- Interns with SELCO Labs	8	
Rural training Institutes	- Rural technicians; village level workers	90	
Entrepreneur Incubation	- Small and mid-sized	2	
Policy	- Number of policies impacted	0	
Process Documents			
End users impacted	- Direct impact	3000	
	- Through partners	3000	
	- Through entrepreneurs	1000	

We will briefly describe the activities of the SELCO Foundation program wise, along with the specific milestones across various categories met by the program.

Product and service related programs:

- User-segment specific programs: LFE, Energy centers, Small Scale agricultural machinery, Urban Communities Labs
- Solar and other RE technologies for higher loads: Solar inverter system, Solar wind hybrid system
- Other products: Improved cookstoves, Driers, Hawker lighting product, Insect Trap, S Light

Outreach and Inspirational activities:

- Internship programmes
- Educational Supplemental Programs- Mechanical Design course; Shristi Lab, Nivasa course
- Rural training: entrepreneur incubation; ITI solar awareness program
- K-12 programmes: Student programme; Teacher training

Policy and Documentation

- Policy initiatives
- Knowledge management: State of the market reports; Process Documentation

Product and service related programs

Tech & Design Team

Micro-grids

Micro-grids offer an alternative model for electrification to solar-home-systems and grid connection. SELCO Foundation is working on the technology for micro-grids and is attempting to establish when micro-grids can be the best solution for energy provision. By analysing existing companies, and attempting at least 4 pilot projects, SELCO Foundation aims to understand how best to create a sustainable model for micro-grids which provide for the energy requirements of a community.

In 2013-14, the SF Technology Team focused on understanding and developing different technical models for micro-grids. A DC micro-grid was installed, and two AC micro-grids are being planned. The performance of each will be monitored over the next year, and extra technology for load control (metering) will be tested. Work on developing a sustainable business model, including the source of funding, operation and maintenance of a micro-grid, was started. Two subsidised community owned micro-grid models were attempted, one could not be completed and the other is ongoing.

Our plans for this year are to continue to refine the technology models for micro-grids, through the next pilot project, and to test out more business models.

KEY LEARNING:

- **A model which provides for the higher energy requirements of a community but which does not require subsidy is yet to be shown:** Companies are providing basic lighting and mobile charging at a fee which covers capital expenditure and is sustainable. However solar-home-systems also offer this model, which less community factors to complicate. A micro-grid model which provides for larger loads (to meet aspirations of community, or to provide more impact on livelihoods) has not been demonstrated to offer capital expenditure recovery and sustainability.
- **Community ownership of micro-grids are difficult to implement:** A pilot project in Allapur, near Gulbarga, was attempted. Community ownership was proposed, using an existing rural development NGO in the village to facilitate. However mutual agreement from the village of 70 households was not possible. A smaller project is being attempted at a site near Chickmagalur.

- **Single-owner micro grids are far simpler to implement:** One pilot project where a land-owner is providing power to low-quality houses on his land through a micro-grid, as well as a micro-grid at a rural residential school, have been quick to progress. These type of systems seem to have good potential for system integrators to take up, provided a technology model can be established.
- **Technology options for micro-grids:** AC micro-grids are less efficient, so increasing the cost of the required solar-power-system. However DC micro-grids for larger collections of houses require specialised equipment, which opens up risk for future servicing and replacement. Metering adds a significant amount to the system cost, the justification of which needs to be established.

GRANT DELIVERABLES

- Pilot project reports (2) – Allapur micro-grid and Mangalore micro-grid.
- Corporate partnership (1) – IBM providing a technology platform an AC micro-grid, giving the ability to test out different payment models.
- End users impacted – 300 to 400 people provided with lighting, 50 to 90 provided with power for TV and fan also. (Numbers vary as houses are rented by labourers on a temporary basis.

Solar Pump

The solar pumping system integrates available pumping technology, powers it with solar and tests for performance (in terms of discharge and power consumption). The project also requires meeting end-user requirements that include affordability and impact raising levels of agricultural productivity, based on land and water depth availability conditions. This project represents a better solution for rural farmers, especially in times of grid failure and power scarcity. Farmers normally have power availability (if connected) in a 10-2pm or 2-6pm schedule, but this technology can function for 6-7 hours, potentially also storing water in a tank for later irrigation after sunset.

This past year the project has focused on identifying vendors and technology supplies that represent a cost effective solution and also offer service and technology guarantees; and building a test bed pump in the office at the same time. Next year, the project aims to design four customized systems to test the technology on the field.

KEY LEARNING:

- **Engaging technology partners** Vendors are very willing to sell pumping products, offering one year warranty but not necessarily competitive prices or after-sales services. Depending on vendors has been very difficult for this project, which requires a change in business mentality and stakeholder inclusion.
- **Test bed: simulating actual field conditions.** With this test bed the Tech & Design team can actually understand the capacity and performance of the pumps and controller, and adjust power configurations of the PV system. The test bed serves to compare available technology and to allow the project to utilize the best pumps and controllers available. This project has implied learning to place the different components of the test bed (pressure gauge, control wall, flow rate meter) to support testing to come.

GRANT DELIVERABLES

- Product innovation
 - Technical products worked on – 1
- Technical testing and evaluation
 - State of the market reports – 1

Energy Efficiency in Livelihood

In most of the businesses or livelihood activities, the machine design; manufacturing processes, business practices etc. are not customized according to the energy scenario. Rural or semi-urban enterprises are usually forced to use

standard technical packages which may not suit their requirements. SELCO Foundation wanted to study and understand how to intervene to create more efficient business and technology systems that also represent economic savings and better outcomes to users.

This year, the Tech& Design team did initial research on the technology in different sectors and chose garment units as the first livelihood activity in which to intervene. The team replaced sewing machine motors to achieve lower energy consumption, and then utilized solar as an alternate energy source to power them. The technology was then passed on to the UCL Team to develop the Sewing Machine Centre. Next year this project is looking at four additional livelihood activities: silk reeling, jaggery, weaving and juice vendors.

KEY LEARNING:

- **Explaining inefficiency in machines:** Typically, when you have grid access, machines are designed for least initial cost and not for best efficiency. In regions where grid electricity is accessible and hugely subsidized, this inefficiency doesn't affect business. In places where access to grid electricity is lower, the expenditure on alternate energy (like diesel generator, solar PV etc.) increases proportional to the inefficiency of the machine. Hence in such areas, by replacing machines with higher efficient ones, even if initial cost of such machines are comparatively higher, it pays back and contributes positively to reduce break-even period and maximize profit.
- **Access to financing:** The primary reason, for reluctance to invest higher initial cost in order to gain better profit in future, is lack of convenient financing options. Although the widely observed fact is "whenever profitable and customized solutions with proper service are delivered to the poor – the repayment rate is very high even compared to urban banks", finding financing entities which understands and trust this fact is still a challenge.
- **Market research:** The biggest challenge in delivering a better solution for rural livelihoods, was to convince the manufacturers to customize design in spite of the low volume of initial enquiries. If there is convincing market research papers that projects the demand and if there is incentives from government for manufactures for such customizations, this may prove more attractive to shift the current market.
- **Awareness on business practices:** In many cases users don't understand the need for maximizing profit by long-term planning. In fact, the readiness of few small enterprises to function at extremely low profit is a big hindrance to driving market price to a profitable level. Awareness on business best practices and collective market judgments may help in improving this scenario, and encourage better efficiency in turn.

GRANT DELIVERABLES

- Report on alternate efficient technical solutions designed for:
 - Small tailoring units: Replacing universal motors with efficient DC motors
 - Industrial garment units: Retrofit clutch control of motor with VFD control
- Pilot project report on Garment unit energy efficiency improvement project and future plan
- Plans to attract different stakeholder to scale the findings and replicate in other livelihoods

Urban Community Lab

Created in 2013, UCL explores inter-linked areas of energy access, water, built-environment and livelihoods in urban contexts. In 2013-14, UCL worked on strengthening its community engagement and partnership efforts, through which its key projects expanded the Integrated Energy Centres, Airlite, designing built environment for slums and water purification. Highlights of the year included the development of an IEC entrepreneur training program in January, a comprehensive Airlite and built environment intervention at a local orphanage, a livelihoods sewing centre serving 40 women, market linkage project for a nomadic community and expansion of our IEC entrepreneurs into other services like refrigeration, laptop download shops and mobile charging kiosks,

Next year, UCL aims to mature the IEC model, strengthen its newer projects (outlined below); and also reach out to labour camps to disseminate and implement UCL's current interventions for the benefit of migrant laborers.

- Livelihoods sewing machine centre: establish a strong consistent market linkage and work out a financial model through which the women can own the machines.
- Water - Plan and raise funds for a complete solar water purification pilot project in 3 or more locations
- Built Environment – Prototype and develop an implementation plan for potential solutions that are desirable, feasible and viable.

Working in the “urban space” the team has been able to reach out to some of the most vulnerable and insecure populations. The challenge of land ownership, political issues and unfortunate social issues, lack of financing for poor households and entrepreneurs has made us aware of types of challenges and has only pushed us to think of more innovative and feasible bottom-up solutions.

KEY LEARNING:

- **Understanding urban communities:** Communities we have reached out to can be described in of four/five different types (slums, low income households, labor colonies, poor institutes, small scale businesses) and even in that, dynamics, awareness levels, priorities and vulnerability levels differed. There was no existing pool of qualitative/ actual data that we could use for water, energy, built environment in the cities underserved communities.
- **Prioritizing interventions:** There are three types of categories even in underserved communities – Critical, Poor and Manageable. We have learned to categorize the community overall and to assess each vertical (water, energy and built environment) based on community needs. [...expand on a bit]
- **Developing a holistic assessment format:** ... follow the Human Centered Design (HCD) methodologies. Using the HCD process we realized that product/design interventions (providing Airlite or providing furniture) will not fully address the dynamics of situations and may be stop gap solutions rather than long term, sustainable ecosystems. Keeping this in mind a range of strategies were formulated which involved both infrastructural and well as behavioral interventions.
- **Structuring the UCL team and process that favour innovation and efficient implementation**

GRANT DELIVERABLES (please include names of projects, interns, etc in parenthesis)

- Product innovation
 - Technical products worked on – N/A
 - Products taken to market – Airlite, Solar sewing machine (2)
 - Business innovations introduced - Fridge, Mobile charging kiosk, Tabla makers (market linkage (3))
- Technical testing and evaluation
 - State of the market reports – N/A
 - Corporate relationships – N/A
- Community organizations:
 - Organizations worked with: Apsa, GMRVF, GNI, , Qwarids, Shop for a Cause, Usha Janone, Soul Sante, Enfold, Kinara Capital, Be fund, (10)
 - Products introduced: airlite, sewing machine table, light stand for hawkers (3)
- University and student relationship
 - Capacity building with students (1) Srishti, Rammaiah, -250 students
 - Interns: 8 Natacha faullimmel, Amit, Noorain, Mani, Anand, Varshita
- Rural training institutes
 - Technicians and village level workers – N/A

- Entrepreneur incubation
 - Small and mid-sized: (12) IEC Operators and Entrepreneurs
- Process documents (5)
 - UCL quarterly report, community (slums, small scale businesses, poor institutes) assessment formats (3), HDC workshop process in UCL
- End users impacted
 - Direct impact:2500
 - Through partners:500
 - Through entrepreneurs: 200

Integrated Energy Centres

Over the past two years UCL initiated and ran almost 15 centers across the state. In 2013-14, IECs grew from a small pilot in 2 locations, to a network of 15 strong energy centres located across Bangalore and Karnataka. Most of these centers have been operator/partner driven since the technology, model and service were in a pilot stage, and entrepreneurship has naturally started taking shape within a few centers.

As the logical next step, UCL believes that all operators have the potential of becoming entrepreneurs. Due to the different type of individuals and processes emerging, it has been important to encourage cross learning (between the centers), stabilize the few centers that did not have the preparation for financial management, and inspire and encourage the operators to run the center as their own business.

Next year, the IECs will expand to six more locations, with pilots of newer services offered to the community; thereby reaching more underserved families and offering more holistic, impactful services. Additionally, the IEC model aims to identify ideal financing entities for these high risk IEC entrepreneurs with the support organizations like S3IDF and Be Fund in incubation and financing. With the required support, the IEC model will convert at least 50% of operators into entrepreneurs in the next quarters.

KEY LEARNING:

- **Operator and Entrepreneur models:** Communities we have reached out to can be described in of four/five different types (slums, low income households, labor colonies, poor institutes, small scale businesses) and even in that, dynamics, awareness levels, priorities and vulnerability levels differed. There was no existing pool of qualitative/ actual data that we could use for water, energy, built environment in the cities underserved communities.
- **Training: When existing entrepreneurs share and tell their story it really helps potential entrepreneurs connect with them on a very real level. Field visits and inspirational stories from the field make them better prepared for the job at hand.**
- **Energy Service expansion:** Since slum households and communities have never had access to customized services, including solar powered community TV, fridge (cooling) facilities and sewing machines, there has been learning on adoption and familiarization on both sides.

Rural Lab

Small scale agricultural machines

Education, Outreach, and Inspirational activities

Education Lab

The main function of the Education team is to explore ways in which education at the K-12 and college levels can be enhanced by exposing students to concepts surrounding environmental, financial and social sustainability. This has been done through renewable energy installations at educational institutions, customized learning modules, workshops, outreach programs and competitions. Education interventions are a platform for youth to understand and evaluate sustainable models and engage their communities to adopt sustainable practices.

In 2013-14, the Education team focused on:

- Renewable energy installations such as – solar-powered computer labs, solar-powered fixed and portable projectors and solar lighting for classrooms and hostels – in 18 educational institutions
- Developing the concept of *model sustainable schools*, where in addition to renewable energy installations, students in the K-12 space learn about sustainability issues specific to their communities and local livelihoods
- Groundwork for Invention Education – a program funded by Lemelson Foundation – that aims to improve the effectiveness of science learning and inspire students to be creative and inventive in the K6-K8 space. This included curriculum development, teambuilding and baseline assessments.

Next year, in addition to focusing on renewable energy installations, the team plans to mature the concept of *model sustainable schools* and implement Invention Education during the academic year. Lessons from these projects will guide future interventions and form a stronger Education Lab.

Key Learning

- **Importance of holistic interventions:** Ensure that renewable energy installations in educational institutions are part of a broader, holistic project, with our goals focused on: improving the technology/computer literacy of students and teachers, increasing an in-depth awareness about renewable energy and community-capacity building.
- **Investing in teacher training:** In the case of our projects such as the model sustainable school, it is important to invest resources in teacher training either directly or indirectly through partners, since the success of such projects is so heavily dependent on the delivery on-ground.
- **Forge key partnerships:** It is essential to partner with other organizations working in the education sector so that knowledge and skills can be shared. It is also important to form partnerships with practitioners (individuals or organizations) in different areas of sustainability, in order to have a strong knowledge resource for our programs such as the model sustainable schools and Invention Education.

Grant Deliverables

- Product innovation
 - Technical products worked on – Portable solar projector
 - Products taken to market – 8 portable solar projectors
 - Business innovations introduced – N/A
- Technical testing and evaluation
 - State of the market reports – N/A
 - Corporate relationships – Eprashala, OPTIT (2)
- Community organizations:
 - Organizations worked with: Agasthya, Sir Ratan Tata Trust, America India Foundation (AIF), (Namma Muthur ?) (4)
 - Products introduced – Solar portable projectors

- University and student relationship
 - Capacity building with students (1) Muthur - 54 students
 - Interns: 1 Ashwathi Iyer
- Rural training institutes
 - Technicians and village level workers – teachers (?)
- Entrepreneur incubation
 - Small and mid-sized:
- Process documents (4)
 - Invention Education content and impact assessment (1)
 - Sustainable model school content??
- End users impacted
 - Direct impact: Solar installations (lights + projectors+ computers) and Muthur (1769)
 - Through partners: SRTT (200), AIF (150)

A sustainable science lab – Muthur Government High School

As part of the Education team’s efforts to develop the concept of a model sustainable school, a sustainable science lab was piloted in the Muthur Government High School. The broad mission of the project was to expose the students to challenges related to environmental and sustainability issues that were specific to Muthur’s community and local livelihoods. The team focused on the following concrete goals:

- To increase awareness about sustainable practices and environmental issues amongst students and teachers
- To connect broader sustainability concepts to issues specific to Muthur
- To expose students to critical thinking, research skills and the spirit of questioning

This was achieved by having the students work on structured projects such as – kitchen gardening in the school, understanding the local sericulture industry, conserving the local lake ecosystem and garbage segregation. Efforts were made to engage the community members in these projects.

Key learning

- **Identifying the ingredients for a replicable model:** In order to have a sustained impact on schools across geographical regions, it is important to have a replicable model that can be easily scaled up. For this, we identified key aspects of the project on which to focus our efforts in the future such as – teacher training, forming partnerships and building community support.
- **Importance of engaging teachers and the community:** In order to have long-term impact, it is essential to use such projects as springboards to effect a change in teaching methodology and lifestyles. For this reason, it is important to engage the teachers and community members in a structured manner.
- **Change in thought process:** One of the reasons for implementing such projects is the hope that in the long term, the students will adopt sustainable practices in their daily lives, hence enabling knowledge transfer to the larger community. However, in order to do this, it is essential to focus on changing the thought process – empowering the students to critically analyze existing sustainable practices, in a proactive manner, and then adapting them to their local conditions.

Grant Deliverables

- Product innovation
 - Technical products worked on – N/A
 - Products taken to market – N/A
 - Business innovations introduced – N/A

- Technical testing and evaluation
 - State of the market reports – N/A
 - Corporate relationships – N/A
- Community organizations:
 - Organizations worked with: Agastya International Foundation (1)
 - Products introduced: N/A
- University and student relationship
 - Capacity building with students: 54 students
 - Interns: Ashwathi Iyer (1)
- Rural training institutes
 - Technicians and village level workers – Lab Instructor (1)
- Entrepreneur incubation
 - Small and mid-sized: N/A
- Process documents
 - Content developed (1)
- End users impacted
 - Direct impact: 54 students + 1 lab instructor
 - Through partners: N/A
 - Through entrepreneurs: N/A

Internship program

The SELCO Labs internship program, in its fifth year of operation continues to attract passionate and motivated interns from various disciplines around the world. This year, through the conventional internship program we saw more than ## interns between the Ujire and Bangalore locations. They have come with a diverse set of skills ranging from engineering to product design and social entrepreneurship to business administration and policy.

KEY LEARNINGS:

- **Importance of well-defined projects:** Internships are most fruitful for the organization and the intern when tasks and deliverables are fairly well defined early on. Intern management requires time and effort in ensuring that the final deliverable is of value to the organization in the medium and long term.

GRANT DELIVERABLES:

- University relationships- Interns (30)

Educational supplemental programs

Education programs and interventions undertaken by different teams across SELCO Foundation. They are generally smaller in scale compared to projects by the Education team, but serve to advance the Foundation's priorities of outreach, inspiration and engagement across its range of work.

Rural SEC

Talks and exhibitions

(Shrishti talk this year) ask for a list of talks, to then summarize or categorize nicely.

Policy

Policy Group

The Policy group undertakes in-depth analysis strongly influenced by field perspectives and facilitates the uptake of recommendations in the areas of decentralized energy access and social enterprise issues. In 2013-14, the Group focused on strengthening existing verticals through engagement with varied ecosystem stakeholders. The group also worked on building the team to include consultants from technology and finance backgrounds and longer term fellows and volunteers.

To have long-term, concrete impact on certain issues that were taken up last year, two significant projects were initiated. A formal partnership was established with CII- Center for Excellence in Sustainability, which is taking the lead on a year-long project to create an appropriate rating tool for Social enterprises, with the support of other social enterprises as well (the lack of which was raised as an issue that we had raised in 2012-13).

By initiating a discussion among interested practitioners, research think-tanks and donors, the creation of a single network for decentralized clean energy access practitioners is closer to becoming a reality. In partnership with the Council for Energy, Environment and Water (CEEW) and other founding members, a concept note and proposal for network establishment has been written.

In addition to these, significant efforts were made to ensure a cross-sector approach, such as the introduction of Energy interventions to support livelihood opportunities, through inputs into the National Rural Livelihood Mission. These discussions are being taken forward with the Mission at the National level.

While the issues mentioned earlier have been taken to the next level for long-term interventions and policy advocacy, initial analysis and research is also being undertaken in other areas. These include Financing schemes for small entrepreneur financing, Portable lighting systems and their utility, Energy efficiency for Micro and Small enterprises and feasibility of Mini-grids.

Further in order to amplify our efforts we plan on publishing a policy quarterly newsletter, print articles in op-eds and/or other publications, public talks and other relevant forms of media advocacy. This would be in addition to on ground efforts to engage with relevant stakeholders through regular meetings than can complement our outreach efforts above. Next year we plan to further consolidate the team, take relevant research-level and cross-sector issues to the next level of active policy engagement. This will be in addition to taking up greater responsibilities in efforts such as Social Enterprise Impact Rating Tool initiative and the Practitioner network (CLEAN).

KEY LEARNINGS

- **Leveraging partnerships:** Although finding suitable partners may be an arduous task, once identified, partnerships play a vital role in taking the project to the next level. Like-minded partnerships with credible organizations can be extremely important in creating a common voice and gathering the critical mass to move the project forward. The partnerships help leverage expertise and reduce duplication of efforts.
- **Creating champions within the target entity:** Whether it is on Impact Investments and Financing for entrepreneurs, or on Energy in the Rural Livelihood Mission, creating one or more champions within the target group can be extremely useful. Key individuals who buy into the concept and can influence the thinking of others (albeit slowly), combined with actionable next steps could make for a more effective approach than mere activism.
- **Unified Practitioner Voices:** A critical reason for establishing CLEAN was to consolidate fragmented voices facing similar issues and to consolidate these viewpoints to relevant bodies or individuals. Since the decentralized energy sector is a nascent one with relatively unknown faces there are tendencies to overlook efforts in favour of larger more lobbied efforts at centralized energy solutions. Over the past year, the policy team has taken critical steps to ensure that the voice of energy access practitioners are heard especially at the Ministry of New and Renewable Energy.

GRANT DELIVERABLES

- Narrative Policy Reports (3) – Investing & Entrepreneur Financing Schemes, National Rural Livelihood Mission Report, Maternal Health Report
- Policies impacted (3) – NRLM, MNRE NSM training & finance, Impact Assessment and Rating
- Process Documents (2) – Sampoorna Loan, Differential Rate of Interest
- Partnerships/ Organizational relationships (2) - CII- Center for Excellence in Sustainability, CEEW (Council for Energy Environment and Water)

Knowledge management and Documentation

State of the market reports: Although initially meant as a means of documenting technical testing and evaluation alone, this category has evolved to include documentation and dissemination of our research on different product-service-systems. These are based on field experiences and expertise of those who have worked in the field for long. Here, the documents put together include Understanding of ‘*current state of biogas*’, and ‘*viability of cookstoves*’.

Process documentation: With specific reference to Process documentation, briefs have been put together on different issues, including: ...

Insights include:

KEY LEARNINGS:

- **Lack of trail of older Foundation projects:** Some of the older projects of the Foundation lack a clear documentation trail and most of the information on the process followed had to be extracted through conversations with Project leads. This is definitely something that has been taken note off in more recent projects with clear documentation trails that make the process easily understandable.
- **Projects have had processes- more unconsciously** –In many cases, even without a specified process, there have been underlying processes replicated in different projects.
- **Need for new forms of documenting processes:** A process document can be a dry document since it may not be able to capture too many aspects through visual images and may rely heavily on written communication. New methods of process documentation must be utilized; including videos, story boards and so on could make the reading easier and suitable for a wider audience.
- **General topic:** outline or expand on it briefly.

GRANT DELIVERABLES:

- State of the market reports: 2 (Including Cookstoves mentioned earlier)
- Process Documents: 4 (including Agri machine testing and LFE mentioned earlier)

Opportunity Criteria Check-in

The Foundation recognizes that not all of the opportunity criteria and questions are appropriate to your program or project. Please only address the questions as appropriate and provide 2-3 sentence responses for those that are relevant for you to answer.

- a. **Direct impact.** What impact has the project had on individuals and/or invention enterprises? Has the project influenced others to use a similar approach? Describe any direct impact the project may have had on the credibility and visibility of inventors and invention enterprises.

The Selco Labs projects has directly benefited more than 10,000 underserved and unserved individuals in terms of bringing them products and energy services. The Labs has also had a great deal of visibility amongst organizations working in the sector and amongst educational institutions.

- b. **Leverage.** Have you been able to bring in co-funding for the project? Describe any visibility received to the project and/or Foundation as well as what other Foundation partners/grantees have been informed or involved with the project.

We have been awarded a grant from the USAID to the tune of \$200,000 to support the work of the Labs and to explore the structure and functioning of additional Labs.

A grant of Euro 150,000 was awarded by the Renewable Energy and Energy Efficiency Partnership (REEEP) to support the work of providing energy services in the state of Bihar through the concept of a women's energy cooperative. This would also lead to the incubation of energy entrepreneurs.

We have also collaborated with the MIT IDI program, and we are the beginning stages of discussions with Villgro and NCIIA on possible joint activities.

- c. **Opportunity for Learning.** Share key learnings or takeaways from your project or program, including what went well and what you might have done differently. Provide data or support that reveals new approaches on how the Foundation might better achieve our goals.

One of our key leanings is the need to separate out the goals of pedagogy and inspiration from impact on communities. In programs where we have tried to take innovations and inventions to people, we learnt practically that fixing single broken linkages lead to quicker impact as opposed to problems involving multiple broken linkages. The intersection of innovations and inventions for the unserved and underserved also requires a deep understanding into needs of people, and what they are willing to pay for and see the value in. The work of Banerjee and Duflo (Poor Economics) explained many paradoxical observations from our work.

On the management side, Running a program of this breadth while achieving focus, impact and quality has been challenging. Currently, staff and interns work across projects from different verticals.

Plans for the coming year include drawing clearer boundaries of staff and work, using somewhat more formal project management techniques, and being pickier in taking on newer projects. At the same time, in order to preserve the open-sourced nature of the Labs, we feel the need to still have a part of the work remain more free flowing, but without a short term expectation of impact.

More focus on business and financial innovations is needed, for which we will look to hire staff with that expertise.

- d. **Financial Commitment.** Describe progress made towards becoming economically self-sustaining.

Tax rules (limitations on business income about \$50,000) prevent the SELCO Foundation from becoming completely self-sustaining. Strategy would be to work with enterprises that are structured as for-profit enterprises and see if those product and service lines can be self-sustaining.

The medium term strategy is to develop a diversity of funders, and we believe that the initial support from the Lemelson Foundation is already helping is build an impressive track record of results that would help us successfully fund raise once we receive our permanent FCRA registration,

In addition, our staff continues to write program related proposals to various agencies. We are also happy to report that Programs that directly benefit underserved communities such as school students like the LFE are also receiving significant donor interest, and this last year alone, more than \$250,000 were committed to the project.

Secondary Criteria

The Foundation expects status updates from all grantees on the Secondary Criteria.

- a. **Population Served.** Include information on whether your program reached or included individuals from disadvantaged communities, under-represented minorities and women. Comment on how your program sought to be inclusive so as to encourage participation from the populations.

The entire program of the SELCO Foundation is focused on underserved communities.

- b. **Environmental Sustainability Plan.** Confirm compliance with the Environmental Sustainability clause in the grant letter agreement and describe any changes that were made to your Environmental Sustainability Plan. Include challenges that you faced implementing your plan and describe what parts worked well and what you might have done differently. Include in your reply similar information regarding how Subgrantees have complied, including challenges that were encountered implementing their Environmental Sustainability Plan of your Lemelson grant.

Communication and Advocacy

As relevant to your project, describe efforts made towards your outreach to policy makers/leaders as well as use of media or other public platforms to educate or inform about invention. Describe the specific reach and impact of your communication efforts. Address how you have used media to further your strategic goals and the strategic goals of the Foundation. Comment on your plans to capture and disseminate your learning. Include any activities that have help illuminate the story of your work such as videos, pictures, lectures, papers, messaging, and other materials.

A Policy Team has been set up, which is involved in outreach to policy makers. The work of the SELCO Foundation has been reported in numerous articles in the Press, both within India and abroad. One such report on NPR has even led a team from GE in Kentucky to collaborate with us on clothes driers. This coming year, we plan to formalize some of our external Communications, and devote staff time explicitly for this purpose.

Inventing Green

Given that Environmental Sustainability is a core value of the Foundation, we would like to track projects (e.g. courseware, student projects, inventions) or companies that contribute to environmental sustainability by inventing green. This would include, but not limited to, things such as renewable energy, green transportation, green chemistry, improving energy efficiency, or anything that is a means to create materials or energy sources and materials with a smaller environmental footprint. This should include projects and activities funded by any subcontracts and/ or subgrantees.

Most projects of SELCO Labs revolve around decentralized clean energy and last mile innovations required to bring those products and services to communities. Examples include Biogas, waste management, sustainable energy challenge ideas, solarmobile, energy audits, hybrid wind system, solar water pumping, and efficient irrigation methods.

Future plans

What key activities are planned during the next reporting period or the next phase of the program?

Activities would largely continue on similar lines to last year, though we aim to be more focused and process driven. All of our large programs described earlier are expected to continue, though with some changes. As more of our programs are starting to show maturity with the gradual emergence of market ready products and services, we are finding a need to start including enterprise incubation programs or at least having ready access to incubation services. To this end, we intend to collaborate with the Selco Incubation Center set up under the S3IDF umbrella, while also seeing how we can work with Villgro.

Expanding our Inspiration, Outreach and Education related activities is also something we are considering.

The grant from USAID will help us drive towards our goal of setting up multiple Labs in order to look at the needs, problems and solutions in more diverse locations and communities.

Finances

If applicable, provide a short narrative explaining significant budget variances or changes to line items.

Expenses have been largely according to the proposed budget line items. There is some underspending in the Project expenses head because some of the projects ended up being paid for by customers, and programs like the Energy Center saw other funders contribute to the project.

Change in Personnel

Adding several medium term volunteers (under a contract of 5 months or more) has meant greater operational support without the need of hiring new people, although SELCO Foundation hired ## employees in the areas of X, Y, Z.

Photos

the **Lemelson** foundation
improving lives through invention