



Lighting a Billion Lives®



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Journey Towards a Billion

Quarterly Newsletter of the Lighting a Billion Lives® Initiative

Journey Towards a Billion is a quarterly update on the latest developments of the Lighting a Billion Lives® campaign, the off-grid market, and the global energy access scenario. Shared with all member organizations and individuals within the Lighting a Billion Lives® network and with our online readers, *Journey Towards a Billion* is an inclusive newsletter welcoming articles, opinions, and stories of change in energy access and clean lighting from India and the world. For comments, questions, or suggestions, please contact our team at Lighting a Billion Lives® at labl@teri.res.in

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Lighting a Billion Lives®

COMMENTARY

In 2016, Lighting a Billion Lives (LaBL) enters its ninth year of operation and while the campaign remains committed to its goal of reaching lives through innovative, sustainable, and responsive energy solutions, it is also now poised to look back and evaluate the growth and learning that has emerged over the past decade.

Possibly the only single campaign to operate at this scale in the world, LaBL has touched over 4.3 million people, across 24 states in India and in 13 countries in Africa and South Asia. The key drivers towards the campaign's wider reach lie in the replication of proven business processes and localized models, the development of responsive technological innovations, and the pooling of knowledge and experience, to enable an environment of collective action.

However, it may be time to now re-think the path forward, and to devise newer approaches that enable the campaign to increase on-ground implementation but also, at the same time, intensify its role in addressing the most primary development goals of ending poverty and hunger, and promoting better health, education, and quality of life.

Partnerships will play a big role here, and as a step towards bringing together global stakeholders to jointly develop pathways for scaling up universal energy access, LaBL is organizing its first conference in the month of April 2016. The role of energy access in the new era of the Sustainable Development Goals (SDGs) and for climate mitigation is ever more critical, especially in terms of the co-benefits it offers in the areas of education, health, livelihood, productivity, and better quality of life.

The year 2016 will be an important year for LaBL, and as a global campaign that thrives on partnerships and collaborations, we look forward to strengthening our existing relationships and forging new associations to scale up access to clean, affordable, and sustainable energy.



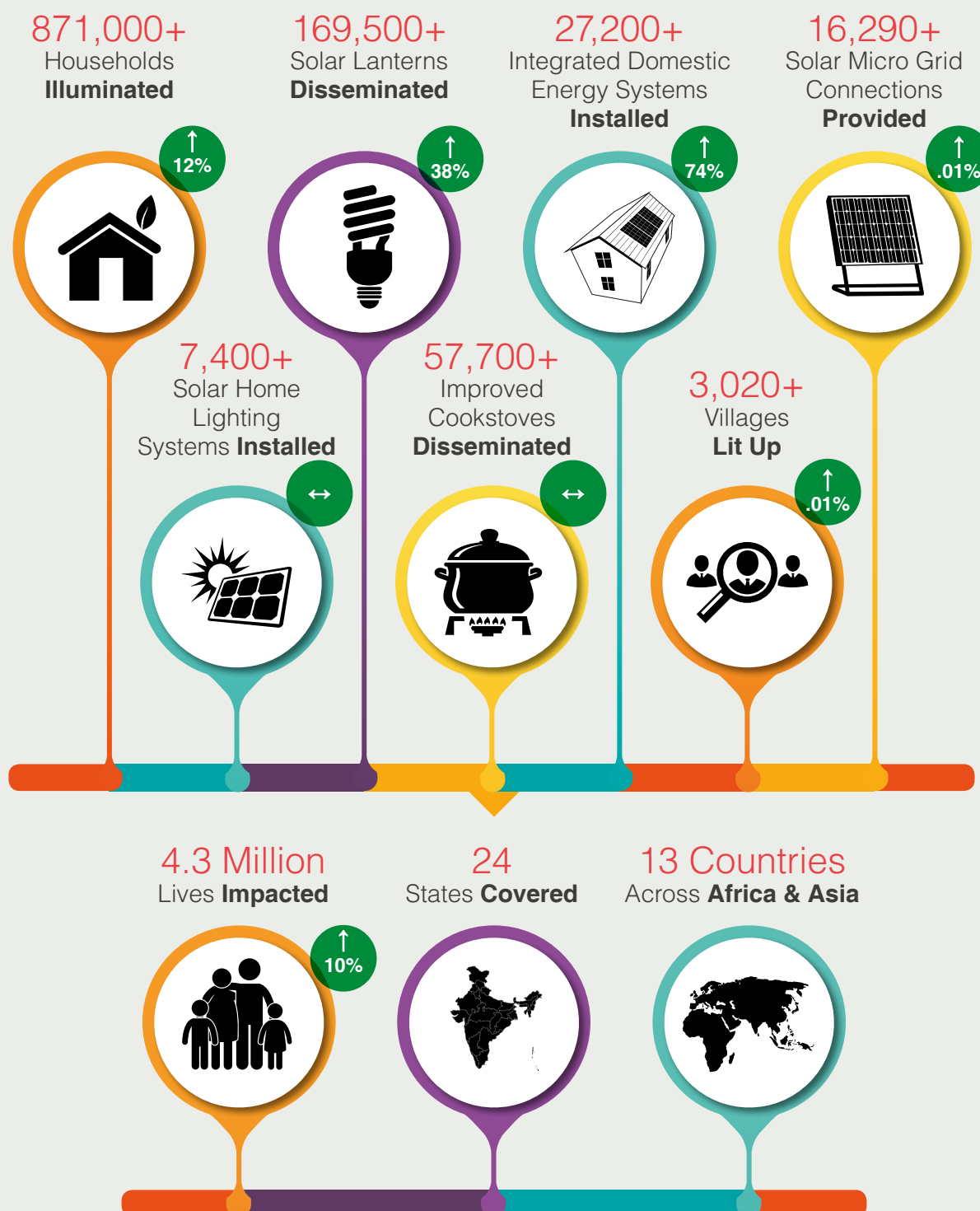
A handwritten signature in black ink, appearing to read 'Ajay Mathur'.

Dr Ajay Mathur,
Director General,
The Energy and Resources Institute (TERI)

LaBL PROGRAMME UPDATE

In 2016, we remain committed to ensuring access to affordable, reliable, and sustainable energy for all.

A quarterly update on the cumulative progress of the Lighting a Billion Lives Campaign as of February, 2016. The percentage change is indicated in comparison to the last update shared, as on September 30, 2015.



NEWS & NOTEWORTHY

Agriculture Insurance Company of India Limited to Support Energy Provisioning in Bihar and Eastern Uttar Pradesh



We are pleased to share that the Agriculture Insurance Company of India Limited, as part of their CSR initiative, has partnered with us to bring affordable and reliable clean energy solutions to 800 households across Bihar and eastern

Uttar Pradesh. The project will specifically focus on the dissemination of integrated domestic energy systems as the core technology solution. Each system will include a forced draft improved mudstove, two LED luminaries, and a mobile charging facility, supported by a solar panel, battery, and charge controller. The project will also facilitate the creation of associated livelihood opportunities by supporting the development of a local energy enterprise through training, access to finance, business orientation, and technical support.

Western Union Lights Up Villages in Four Indian States



With an aim is to make electricity available to those who have never seen or experienced light in their homes, Western Union Company, a leader in global payment services, partnered with Lighting a Billion Lives (LaBL) to enable access to clean lighting in several remote and un-electrified villages in Uttar Pradesh, Bihar, Maharashtra, and Andhra Pradesh.

Under this collaboration, Western Union committed to contribute up to INR 100 for each Western Union remittance received in India from designated countries for the period October 15 to November 30, 2015. The contributions through this exercise have been significant and have made it possible to support the installation of integrated domestic energy systems (IDES) in a total of 10 villages across the four states.

The first set of installations were completed in December 2015, where 200 households across five remote villages in Purnea, Bihar received the IDES systems. Further installations in 10 more identified villages across Uttar Pradesh, Maharashtra, and Andhra Pradesh will commence soon.





IDBI CSR Initiative: Installation of Clean Energy Solutions across 110+ Villages and 5,000 homes in Four Indian States



In September 2014, IDBI partnered with Lighting a Billion Lives to support the provision of clean lighting and cooking solutions to un-electrified and remotely located villages in Bihar, Jharkhand, Uttar Pradesh, and Odisha. We are delighted to share that the implementation phase of this project has been completed and 5000 households across 111 villages in these states now have a cleaner and more efficient mode of lighting and cooking.

Three types of technology have been installed under this project, based on local need assessments and consumption patterns. These are solar charging stations supporting 50

LED lanterns each, solar micro grids that provide lighting to 50 households per unit through LED luminaries, and standalone integrated domestic energy systems that include two LED luminaries, a mobile charging facility, and an improved cookstove.

One of the key efforts under this project was to bring light to extremely remote areas where communities had never been exposed to electricity. Notable among these are the villages in Kalahandi and Rayagada districts of Odisha. In Rayagada, Dongria tribals of Duragudi village experienced the joy of electricity for the first time. The Dongria Kondh is an indigenous tribe located in the Niyamgiri hill range in Odisha, an area of densely forested hills, deep gorges and cascading streams. With support from local NGO partner Mahashakti Foundation, 41 Dongria homes now get power supply for lighting from a centrally installed solar micro grid. The village sarpanch, Arakhita Hikka, said that the solar micro grid would fulfill a long-standing and long-awaited need of electricity for the tribals.

PGCIL CSR Project: Disseminations Complete

The Power Grid Corporation of India Limited (PGCIL), under its CSR initiative for sustainable development, partnered with TERI to facilitate the provision of standalone solar lanterns to school children across Bihar, Jharkhand, and Odisha. We thank PGCIL for their support in making this activity possible, and in successfully bringing a clean lighting solution to 10,300+ school children in energy impoverished regions.

The last leg of this dissemination activity concluded in December 2015, with over 4,000 lanterns distributed among students of rural and remote tribal communities in the Kalahandi, Nabrangpur, and Koraput districts of Odisha.



In an effort to make this a more engaging and meaningful activity for the children, and to create awareness around clean energy and its benefits, a set of four info-comic-cum-colour book editions were also developed and distributed among the children with their standalone solar lantern. To this end, more than 41,000 info-comics have been distributed under the project. Post dissemination, classroom sessions for teachers and children were conducted to explain the proper operation and maintenance of the lanterns.



Several district-level government and administrative officials including the Collector (Kalahandi) and the District and Block Education Officers at Kalahandi, Purnea, Khunti, and Bero lauded PGCIL's CSR initiative for clean energy access.

We are grateful to the following officials from PGCIL whose support, active participation, and hands-on commitment have made this project a huge success:

- Mr Atul Trivedi (ED, Power Grid)
- Mr S Sen (ED, Power Grid)
- Mr G V Rao (DGM, Power Grid, Bhubaneswar)
- Mr S K Singh (DGM, Power Grid, Lakhsisarai)
- Mr V Ram Prasad (AGM, Power Grid, Jeypore)
- Mr George Denny (AGM, Power Grid, Ranchi)
- Mr A K Singh (AGM, Power Grid, Purnea)
- Mr B K Mundu (Chief Manager, Power Grid, Patna)
- Mr Samir Kumar (Chief Manager, Power Grid, Gurgaon)
- Mr Parmeshwaram (Deputy Manager, Power Grid, Bhawanipatna)
- Mr A Mudali (Deputy Manager, Power Grid, Indravati)
- Mr A B Mohamed (Power Grid, Jeypore)
- Mr S B Sarkar (Power Grid, Ranchi)
- Mr K B Rao (Power Grid, Jeypore)
- Mr Debasis (Power Grid, Jeypore)
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- Mr Praveen (Power Grid, Bhavanipatna)
- Mr Ravindra (Power Grid, Jeypore)
- Mr V S S Rao, (Power Grid, Jeypore)



Impact Assessment of NTPC CSR Project



In October 2014, National Thermal Power Corporation (NTPC) Limited and The Energy and Resources Institute (TERI), with support from the District Administration of Angul, joined hands to provide clean energy access for lighting and cooking to 500 households, across 12 villages, in and around the Satkosia Tiger Reserve in Odisha. The objective was to deliver a clean energy technology that addressed lighting and cooking requirements through a single system. TERI's integrated domestic energy system (IDES) was adopted as the technology of choice and comprises of two LED luminaries, a mobile charging point, and a forced draft improved cookstove, powered by solar panels. The system is designed to sustain a daily load of basic household energy needs, and delivers enough power to provide light for five hours, mobile charging for two hours, and battery backup to run the fan in the forced draft cookstove for four hours. Post completion of the project, an impact assessment exercise was conducted, in December 2015, with beneficiary households to understand the transformational experience they underwent, in terms of the quality of energy they now had access to, and the associated benefits they derived from it.

The study revealed that, overall, there was a reduction in the dependence on fuel for lighting and cooking, and therefore less time spent in fuel collection. This also led to reduced expenditures on acquiring fuel wood and kerosene. People experienced better health, women now found time to rest, and the scope for engaging in additional income generation activities definitely went up.

Users preferred the forced draft Improved Cookstove (ICS) over the traditional mud stove as it took less cooking time, required lower fuel quantities, and emitted significantly lower amount of smoke compared to a traditional mud stove.

Users also expressed that the steel stove offered convenience due to its portability and could be moved to cook inside as well as outside the house. The installation of the IDES has greatly reduced the burden of fuel collection, which was a major source of physical drudgery for the women. With no alternatives for lighting other than kerosene lamps, the LED luminaries that come with the system are also a huge boon for the households. Not only are they now spending less per month on fuel for lighting, but are also enjoying better visibility inside their homes, leading to higher productivity rates. The mobile charging facility is a particular upgrade and convenience for the users, as they are now able to remain in contact with family members who are travelling or staying in distant cities.





#SupportNepal: 440 Earthquake Victim Households in Sindhuli Receive Solar Lamps

ICIMOD

In April 2015, Nepal was hit by a devastating earthquake, killing thousands and rendering many homeless across Nepal and India. To aid relief efforts, lend security and a level of comfort in this time of distress, TERI collaborated with the International Centre for Integrated Mountain Development (ICIMOD), Nepal, to disseminate 1,000 standalone solar lanterns to earthquake-affected communities and families as part of the Lighting a Billion Lives (LaBL) campaign. The solar lanterns were provided at a special rate by technology partner, Avni Energy Solutions Pvt. Ltd and transported to Nepal by road. With ICIMOD, the dissemination of all 1,000 lanterns is now complete. Below is a description of the last tranche of disseminations by ICIMOD's Mr Nilhari Neupane.

Nearly 440 earthquake-affected households from Ratanchura and Baseshwor VDCs* of Sindhuli received solar lantern sets. Both VDCs are piloting sites for local level water use master plans (WUMP) in Sindhuli and are severely affected regions of the April 25, 2015 earthquake. Since 2014, under the Koshi Basin Programme (KBP), ICIMOD, and HELVETAS Swiss Inter-cooperation, Nepal, have initiated collaborative action research to develop Water Use Master Plans (WUMPs) at the catchment level in the three districts of Sindhupal Chowk, Sindhuli, and Saptari, that represent three ecological zones of the Koshi Basin.

*VDC – Village Development Committee

ICIMOD had received solar powered lamps from TERI to support earthquake victims of Nepal. To distribute these in the affected VDCs, prior coordination with CDO (Sindhuli), VDC representatives, local leaders, and Nagarik Manch was done through partner organization, Helvetas and several local NGOs in Sinduli, including, Ghoksila Sewa Samaj and Community People Awareness Program (CPAP).

Due to a high demand for these lamps, a selection criterion was developed by the local authorities and priority was given to earthquake victims, un-electrified households, women-headed households, and dalit households. On December 23, 2015, local stakeholders organized a formal programme for the distribution of lamps, with more than 300 households in attendance. Representatives from ICIMOD, HELVETAS, partner NGOs, and VDCs attended the event as well.

The solar lanterns were well received by the earthquake victims. Recipients mentioned how these would be very helpful for their children as school final examinations were approaching. Women expressed how the lanterns would help them extend their household work hours to later in the night and also allowed them to attend adult literacy classes in the evening. Most men planned to use the lanterns when they irrigated their land at night, which would be easier to do now, as they have to go to the source of water and walk along the canal several times during their irrigation turn. The solar lanterns were also well received by the local community, who expressed their gratitude towards TERI and ICIMOD for their support. They also appreciated the efforts made by Helvetas and local NGO partners for organizing the event and making the lamps available to those in need.



SDSN South Asia: Third Global Youth Meet 2015

The third edition of the Global Youth Meet (GYM 2015) was held in December 2015 at Vishakhapatnam. Martand Shardul, Associate Fellow, TERI, and Representative for South Asia at the Youth Assembly of United Nations Sustainable Development Solutions Network (UNSDSN), moderated the session titled, 'What are the Global Goals and how can youth contribute to the operational road map?' The session highlighted the transition from Millennium Development Goals (MDGs) to Sustainable Development Goals (SDGs) and emphasized on the linkages between Goal 7 (Affordable and Clean Energy) and Goal 3 (Good Health and Well-Being). Mr Shardul further underlined the role played by finance and functionally effective institutions in the attainment of the SDGs, as well as the importance of time-bound targets and metrics to measure the progress of each goal.

Ms Devakshi Nayar, founder of Hope Collective, emphasized on the need for social entrepreneurship, explaining the value that social entrepreneurs brought by not only addressing social needs with their unique for-profit model, but also by generating livelihood opportunities. Ms Ramya Emandi, Assistant Manager, Indian Oil Corporation Ltd, highlighted the role of PSUs in countries like India, where they are looked upon with a higher degree of trust and respect as they have a dual role to play—achieving business commitments and simultaneously ensuring that primary needs, such as access to fuel for cooking, lighting, and transport, are adequately met. She added that, public sector undertakings (PSUs), under the direct supervision of the government, are also more likely to abide by environmental norms. In context of the youth, she spoke about the evolution of PSUs in terms of new areas of operation, the introduction of new roles and departments that provide an opportunity to the younger generation to work passionately.

In his concluding remarks, Mr Shardul extolled the newly launched youth arm of the Sustainable Development Solutions Network (SDSN) as an opportunity for the youth to engage in the global conversation and momentum acquired for

knowledge creation and sharing. In the age of Information and Communication Technology (ICT), the youth is most empowered to drive the SDGs and nurture change for the better. He invited youth groups to register with SDSN and SDSN Youth.



GYM 2015 was organized by HRIDAY in partnership with Visakhapatnam based Visakha HRIDAY-SHAN and the Public Health Foundation of India (PHFI). GYM 2015 envisions addressing the overarching theme of 'Youth, Health and Development' with special focus on youth perspectives on creating an enabling environment for development. In the context of the SDGs, GYM 2015 focussed on youth-led innovative strategies and techniques to advocate for supportive policies, nationally and globally, that facilitate a sustainable and healthy future. Nearly 160 youth delegates, from 30 countries, attended GYM 2015 to deliberate on youth-led action on the newly adopted SDGs. With a resolve to 'guard the globe', the delegates presented a 17-point youth declaration encompassing all 17 global goals and emphasizing the health and development needs of young people. The event was inaugurated by Shri Venkaiah Naidu, Hon'ble Union Minister for Urban Development, Housing and Urban Poverty Alleviation and Parliamentary Affairs, Government of India, with the Hon'ble Health Minister of Andhra Pradesh Mr. Kamineni Srinivas.



WOMEN & ENERGY

Empowerment through Inclusion

“Women can and must play an active role in planning, producing, supplying, and managing of energy. There can be no energy for all that is sustainable unless we tap into the energy, engagement and expertise of women”.

Lakshmi Puri, Acting Head of UN Women, April 2013

Women are a key, though underutilized, resource in the energy service delivery process. Primarily viewed only as energy consumers, in the majority of affected regions, it is the women who experience energy poverty much more severely than men.¹ There is a clear correlation between poverty, the lack of access to energy, and gender inequality, as it is well-known that men and women in developing countries have differing roles and responsibilities, which is reflected in their energy needs and priorities.² In most ‘BoP’ communities across the world, the entire burden of providing for a family’s energy needs fall on women. In the absence of modern sources of energy for lighting and cooking, women spend nearly 40 hours a month collecting fuel wood, which further, when used to cook over open fires causes her and her family to develop severe respiratory and lung diseases. On an average, women endure 14-hour long work days to fulfill just the basic needs of their families that is, fetching water (which requires them

to walk several miles every day) and providing food. **With no time, energy or opportunity to pursue any developmental or livelihood activities, women remain confined to their homes, making it nearly impossible for them to break free from drudgery and poverty. Forced into lives of dependency as non-earning members, they end up having limited or no decision-making powers and are allowed lesser and lesser access to education, credit, land, and power.**³

The energy sector has largely been viewed and approached as a capital-intensive, large-scale, and commercial space where energy service delivery follows a bullish supply driven approach. In the process, however, most energy provision initiatives view and consider women as merely recipients of the intervention and fail to factor in the gender dimensions that may actually influence and reveal the effectiveness and sustainability of the solution; in the absence of active



¹ UNWOMEN. SE4All: The Gender Dimensions. UNWOMEN, UNIDO, 2014

² Women's Economic Empowerment Through Energy Access in the MRU Sub-region. Paper, Cape Verde: ECOWAS, 2014

³ Cecelski, Elizabeth. “GENDER AND ACCESS TO ENERGY SERVICES.” Sustainable Development, UN. May 2014

consultations with local women, many clean technologies fail to succeed simply because women's needs and interests have not been considered.

Participatory processes are important requisites in mainstreaming women into the energy access value chain. But more importantly it is the form of participation that is devised over and above the mere presence of women that will define true gender inclusion.⁴ Women's particular roles in their families and communities, as well as their credit risk profile, make them potentially more suitable and effective than men for specific roles within the energy access sector. In turn, this helps women to benefit from new employment opportunities and higher incomes and creates positive implications for the community at large.⁵ **Through the course of its clean energy access interventions, TERI consciously adopted the practice**

of Energy Provisioning through Inclusive Collaboration (EPIC), as a simple premise when developing localized energy service delivery models—identifying specific roles for women to facilitate last mile disseminations and the serviceability of clean lighting and cooking technologies.

Keeping in view the commercial viability of the clean energy intervention and the social objective of inclusion and empowerment, the EPIC approach effectively enables grassroots institutions to function as commercial energy enterprises and involves women as active participants in the energy provisioning process, creating a gender sensitive value chain and an empowerment opportunity that manifests itself through enterprise and skill development, the disintegration of gender stereotypical roles, and positive societal transformations.

Noor Jahan's story, that recently not only caught the attention of the Hon'ble Prime Minister of India, Shri Narendra Modi, but also of the media and the public at large, is one such example of this inclusive and collaborative energy provisioning approach. In 2012, under a Lighting a Billion Lives project sponsored by Indus Towers in the Kanpur Dehat region, Noor Jahan, a 70-year-old widow, was identified and trained to operate and manage a solar charging station (SCS). The intervention proved to be a huge boost for Noor Jahan, economically, socially, and individually.

After the death of her husband, she was left to support her five children single handedly, and struggled to make ends meet as a daily wage labourer. Making just over a thousand rupees every month, living conditions in her home and family deteriorated severely.

This changed in 2012. Trained and equipped to manage the solar charging station in her village, Beri Dariyawan, Noor Jahan became a village-level energy entrepreneur, and was able to earn nearly double the amount of money she made as a daily wage labourer. Renting out lanterns to her fellow villagers at the nominal rate of ₹3 per day, she became a revolutionary energy provider in a village



that was otherwise devoid of any electricity supply. Slowly and steadily, Noor Jahan has been able to build up her saving and even support her children, who are grown up individuals now. There has been a collective improvement in the quality of lives of Noor Jahan and her fellow villagers who experience better health, cleaner indoor environment, and better light to work or study in.

A simple approach that consciously involves and prepares women to become valuable participants in the delivery of clean energy as entrepreneurs, service providers, and promotion agents, has enabled Lighting a Billion Lives to establish over 800 such women energy providers across India. It is indeed gratifying to see the progress of these women being recognized by the Hon'ble Prime Minister of India,

Shri Narendra Modi himself. Noor Jahan's story is a testimony to the success of nearly 800 other women across India, who like her, are also micro energy entrepreneurs, and who, as agents of last mile energy access offer a viable, sustainable, and much needed local solution to a global problem.

Contributed by: Bigsna Gill

⁴ Clancy, Joy. Late Developers: Gender Mainstreaming in the Energy Sector. Paper, Enschede: University of Twente, 2010

⁵ Kathleen O'Dell, Sophia Peters, Kate Wharton. Women, Energy, and Economic Empowerment. September 18, 2014. <http://dupress.com/articles/women-empowerment-energy-access/> (accessed February 17, 2015)

PARTNER CASE STUDY: SALESFORCE FOUNDATION



Solar Energy Integrated Village Community Library and Resource Centre

Salesforce.org has been a long standing partner of TERI and Lighting a Billion Lives, lending strategic and financial support for various community development, energy access, and educational and awareness creation projects in Karnataka. In the past, their support has enabled seven villages in the Guntur District to receive solar lighting as part of a clean energy access initiative. Another project involved the generation of renewable energy-based livelihood opportunities for rural women by providing their self-help groups with a revolving fund to start small enterprises in addition to the provision of energy efficient improved biomass cookstoves and solar lanterns.

Most recently, the Salesforce Foundation joined hands with TERI to establish a community library and resource center in the village of Karkihalli, in Koppal district, Karnataka. Funded under the 'Healthy Community Grant' of the Salesforce Foundation, the project was conceptualized by the Rural and Renewable Energy team at TERI Bangalore, targeting rural communities, particularly children, youth, and the elderly to inspire their knowledge development. Locally called the 'Nammora Granthalaya' (Our Village Library), the initiative received a very positive and enthusiastic response from the

community with the active involvement from the local Gram Panchayat, Youth Association, women self-help groups, and the local school.

The Panchayat, recognizing the benefits of a village library and resource center, was extremely cooperative and forthcoming in donating a building for the library. TERI undertook renovation for this building, using cost-effective designs and local resources, furnishing it with open racks, storage cupboards, chairs, and tables to provide a reading space.





Three solar home lighting systems and a mobile charging facility were also installed to make the library accessible and usable in the evenings. The project received huge support and encouragement from staff volunteers of Salesforce.org as well, who got involved in the beautification of the building and its surrounding areas, painting colourful motifs on the walls, and planting trees. Once established, news of the new village library spread quickly in surrounding villages as well and the inauguration ceremony included games and art competitions for children to participate in. The library currently has over 500 books, collected from various government departments, educational institutions, and the TERI Library.

Impact: Since its inauguration, school children and youth have benefited immensely from the library. School children use the library during or after school hours, and youth visit it in the evenings and on holidays. Children from neighbouring villages also visit it frequently. The solar powered lighting in the library has been especially useful for the children, who are able



to study and read at night when power cuts prevent them from studying at home, which is a frequent occurrence. Readership data has shown that over 5,600 children and youth have visited the library so far, with an average of 560 children and youth visiting it every month to read books and newspapers. People of Karkihalli village have also started using the library premises to organize cultural activities, games, quiz competitions, etc., making it the center of community interactions.

Sustainability & Management: The library is under the overall supervision and management of the Namooru Granthalaya Committee, which consists of members from the village youth association, representatives from the Gram Panchayat, school teachers, and Sarvodaya, a grass root NGO. A part-time employee has been hired for the day-to-day management of the library, who is also a resident of Karkihalli, and manages the library under the guidance of Sarvodaya.

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Contributed by: Y Nagaraju

STORIES OF CHANGE

How the Adoption of Integrated Domestic Energy Systems in Mewat led to Enhanced Incomes and Better Health

Most of us, who are fortunate enough to live in well-developed areas of the world, tend to take electricity for granted. It is hard to imagine how we could function smoothly for even a single day without electricity when so much depends on it. Electricity fulfills much more than our basic need for lighting after dark; it powers our homes, refrigerators, televisions, computers, and most importantly, mobile phones—keeping us connected to the world at a moment's notice.

But take a moment to think about the 1.1 billion people around the world who continue to live without access to electricity or any other clean source of lighting for that matter. In India alone, there are 300 million people living in these conditions. Surviving primarily on kerosene and other biomass fuels like fire wood and cow dung to illuminate their homes and cook food, they are paying a very heavy price— both monetarily and medically, by exposing themselves to toxic fumes and extremely harmful emissions that affect their eyes, lungs, and nervous systems. However, with no access to cleaner fuels for lighting and cooking, they have little choice in the matter.

Mewat is a district in the state of Haryana, located not very far from Gurgaon, a leading financial and industrial hub with the third highest per capita income in India. With a population of just over 10 lakh people, Mewat is roughly equal to the nation of Cyprus. The main occupation here is agriculture along with other allied and agro-based activities. However, Mewat has remained a region of backwardness since independence, lagging behind the rest of Haryana on almost every yardstick of the development index.

how to operate it and the associated benefits it delivered. Following this, 600 integrated domestic energy systems (IDES) were installed in households across 10 villages in the district. With clean lighting and cooking solutions, many households expressed a marked difference in their indoor environments. The incidence of headaches due to smoke and strain on the eyes reduced significantly, respiratory discomfort, which had become a common feature, also reduced drastically and largely, those who had adopted the technology felt healthier and happier.



In 2014, with support from PEC Ltd, a premier trading company based in Delhi, and in partnership with several local partner organizations, Lighting a Billion Lives introduced clean energy solutions for lighting and cooking in several villages across the Nuh block in the district. Live demonstration campaigns were conducted at the village and household level as well as in moving vans, to help people understand the system,



The project also enabled improvements in hours of productivity, allowing shopkeepers to extend their hours of business, resulting in an increase in their income.

Shakir runs a general store and mobile recharge service in the Firozpur Namak village, and claims that installing the IDES has been a blessing, enabling him to increase his income by



rupees 1000–1200 every month and contributing towards a better standard of living. “Kerosene oil and candles were our only source of light and we spent up to ₹300 every month to get some level of illumination in our shops and homes. This forced me to close business by 8 pm, as it got too dark to operate. Since installing the IDES, I have not needed to use any other lighting source in my shop. The LED luminaries produce bright light and now I am able to keep my shop open till 10:30 pm,

which has greatly contributed to an increase in my monthly income”, he says.

With the improved cookstove that is included in the Integrated Domestic Energy System (IDES), Shakir is also able to save on cooking time. The portability and durability of the steel stove has allowed him to use the cookstove in his shop to sell tea as well. “This is a cost effective solution that requires less fuel than the traditional cookstove I was using earlier. I also save on cooking time and my home and shop are nearly smokeless now”, he shared. Shakir’s brightly lit shop now has a stream of regular customers who tend to flock to the shop for an after dinner cup of tea everyday.

An impact study to assess the efficiency of the 600 installed IDES systems revealed that an estimated saving of approximately 46.82 kL of kerosene and 698 metric tonnes of fuel wood per annum. In addition, with marked reduction in the levels of indoor air pollution, families also saved on medical expenses for common ailments like watery eyes, headaches, and other respiratory disorders. Overall, this project positively impacted more than 3,300 lives.

Contributed by: R C Pal

Adopting Clean Cooking and Lighting Technologies for a Cleaner Environment and Better Health

Village: Khurandi, Block: Churchu, District: Hazaribagh, State: Jharkhand

Mundri Devi, 40, lives with her family of 7 in the Khurandi village of Hazaribagh district, Jharkhand. Situated 25 km from the district center, Khurandi is a remote village surrounded by forests on all sides. The village consists of over 200 households, with each average household size of five to seven members. Like several others in the village, Mundri Devi and her family are primarily engaged in agricultural activities and sell their produce in the local market that is held twice a week in their village, the earnings from which are their main source of income and sustenance.

Mundri Devi, a hardworking woman, constantly strives to provide for her family to the best of her abilities in her limited means. As the woman of the house, it was her job to cook for the entire family, which she did on a traditional cookstove. She shares how cooking on a traditional stove not only utilized a lot of firewood and other fuel but also produced a lot of smoke that made her eyes watery, gave her headaches and a hoarse throat, making breathing more difficult. She was aware that all this smoke was very harmful for her as well as for the others in the house but did not know what other choice she had.

A lot of her time was also spent looking for firewood in the adjoining forest, which became a harder task during the monsoon, when finding dry wood was a challenge. In such situations, keeping the cookstove fire going became an even more daunting and extremely uncomfortable task, as Mundri had to keep blowing into the cookstove to feed oxygen for combustion, and at the same time also had to endure the intense smoke that the damp wood emitted. The situation was no better for lighting either, as everyone in the village used kerosene lamps, which did not provide sufficient light for children to study in or for women to cook

in and it was next to impossible to get any productive or livelihood activity done after dark.

In 2013, Mundri Devi joined a self-help group affiliated with Jan Sewa Parishad, a local NGO that has been in operation in the rural and remote areas of Bihar and Jharkhand since 1990. After shedding her initial inhibitions, Mundri Devi was able to derive immense emotional, economical, and practical support from her peer group, pooling her savings, discussing common issues and sharing solutions and experiences.

The same year, in partnership with TERI, Jan Sewa Parishad introduced its self-help group members to clean cooking and lighting technologies, sharing information, details, and their benefits. The members were also told about the IDES that could provide four to five hours of lighting in the evening and had a mobile charging facility. It also included a forced draft improved cookstove that used less fuel/firewood, produced less smoke, and reduced cooking time considerably. A forced draft cookstove enables more complete combustion of fuel, leading to lesser production of ash, better generation of heat, and more optimum utilization of fuel.

“Once we were told about this integrated lighting and cooking system, I decided to adopt it and experience the benefits for myself. TERI and Jan Sewa Parishad also instructed us on how to use the system well and provided simple maintenance tips”, says Mundri Devi. Each IDES installed in the village included a 20 watt solar PV panel, a 10 mAh battery, a charge controller, one improved cookstove, two LED luminaries, and a mobile charging point. After installing the IDES in her home, Mundri Devi experienced a drastic improvement in her indoor environment. There was now better lighting for her children to study in and for her to cook in and a more efficient stove to cook on. Mundri Devi was experiencing all the benefits that she had heard and shared these with her group members, encouraging them to also invest in the system. She also became an ardent promoter of the solution in her village, explaining its benefits for the family as well as the environment and forest.

Mundri Devi shares that her firewood consumption has gone down by nearly 50 per cent since she has started using an improved cookstove and she is also saving on her expenditures for kerosene that was used for lighting. Also,



earlier because of a home full of smoke, cold and cough were an ongoing ailments for her children, but since she has started using the improved stove, their health has improved a lot as well. Because of the time she saves in cooking and housework, Mundri Devi is now able to spend more time in their small daily needs shop and help her husband in the fields.

“I cannot express enough how much things have improved since I adopted the IDES in my home. I feel that everyone in my village should learn from my example and save the money they are spending on health issues and kerosene and instead invest it in this clean energy solution”, she says.

Contributed by: P B Singh

AWARDS & RECOGNITION

Green Gown Award 2015 for Community Innovation—OASYS South Asia

The ‘Off-grid Access Systems for South Asia’ (OASYS South Asia) project implemented by TERI and a consortium of research partners led by De Montfort University, UK, was awarded the 2015 International Green Gown Award for Community Innovation in November 2015.

The OASYS South Asia project undertook demonstrations of off-grid options using solar PV-based mini/micro grid systems at four locations in India. It provided access to basic lighting and mobile phone charging facilities as well as

supported the use of electricity for productive, educational, and social purposes (street lighting, community halls, etc.). The project directly impacted nearly 5,000 households and reduced their dependence on kerosene, which in turn reduced adverse environmental impacts and accidental risks; offered opportunities to study at night; created an improved sense of security at night with street lights; and empowered the communities through better information flow and newer opportunities for income generation.

The Green Gown Awards are organized by the UK Environmental Association for Universities and Colleges (EAUC), a not-for-profit charity with a membership of over 215 universities and colleges, supporting sustainability within the UK tertiary education sector.

Aegis Graham Bell Award—M2M Solution

Vodafone Business Services, in collaboration with TERI and Nexleaf Analytics, developed a Machine to Machine (M2M) solution that received the Aegis Graham Bell Award and was honoured as one of the best innovations in the field of TIME and SMAC. The M2M solutions allow scientists to remotely collect data from Nexleaf’s StoveTrace sensor, deployed in

improved cookstoves installed by TERI in Uttar Pradesh. The solution operates through Vodafone’s data network, where the SIMs are managed through a central service platform. It helps to track the utilization patterns of improved cookstove users and provides data points, linking climate change to biomass and other clean energy used as domestic cooking fuel.

The Aegis Graham Bell Award is India’s largest and only award in field of TIME (Telecom, Internet, Media, and Edutainment) and SMAC (Social, Media, Analytics, Cloud) and was held in November 2015, at the NDMC Convention Centre in New Delhi. Organized by Aegis School of Business, Data Science & Telecom and Convergence India, the awards are supported by Cellular Operators Association of India (COAI) and Telecom Centres of Excellence (TCOE) India.

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