ICICI Lombard
Nibhaye Vaade

Impact Assessment Report for

Solar Panel Installation Project

Disclaimer for the Impact Assessment Report

- This report has been prepared solely for the purpose set out in the Memorandum of Understanding (MoU) signed between Renalysis Consultants Pvt. Ltd. (CSRBOX) and ICICI Lombard to undertake the Impact Assessment of their Corporate Social Responsibility (CSR) project implemented.
- This impact assessment is pursuant to the Companies (Corporate Social Responsibility Policy) Amendment Rules, 2021, notification dated 22nd January 2021.
- This report shall be disclosed to those authorised in its entirety only without removing the disclaimer. CSRBOX has not performed an audit and does not express an opinion or any other form of assurance. Further, comments in our report are not intended, nor should they be interpreted to be legal advice or opinion.
- This report contains an analysis by CSRBOX considering the publications available from secondary sources and inputs gathered through interactions with the leadership team of ICICI Lombard, project beneficiaries,and various knowledge partners. While the information obtained from the public domain has not been verified for authenticity, CSRBOX has taken due care to receive information from sources generally considered to be reliable.
- In preparing this report, CSRBOX has used and relied on data, material gathered through the internet, research reports, and discussions with personnel within CSRBOX as well as personnel in related industries.

With Specific to Impact Assessment, CSRBOX:

- Has neither conducted an audit or due diligence nor validated the financial statements and projections provided by ICICI Lombard;
- Wherever information was not available in the public domain, suitable assumptions were made to extrapolate values for the same;
- CSRBOX must emphasise that the realisation of the benefits/improvisations accruing out of the recommendations set out within this report (based on secondary sources) is dependent on the continuing validity of the assumptions on which it is based. The assumptions will need to be reviewed and revised to reflect such changes in business trends, regulatory requirements, or the direction of the business as further clarity emerges. CSRBOX accepts no responsibility for the realisation of the projected benefits.
- The premise of an impact assessment is ‘the objectives of the project along with output and outcome indicators pre-set by the programme design and implementation team. CSRBOX’s impact assessment framework was designed and executed in alignment with those objectives and indicators.

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Executive Summary

Recognising and embracing its responsibility to communities across India, ICIC Lombard has initiated its CSR interventions. The projects demonstrate the responsibility of community stakeholders, as well as are aimed at encouraging non-profit humanitarian work to bring positive change in society.

ICICI Lombard undertook initiatives to promote the generation and usage of renewable energy by communities through the installation of solar panels. As a part of the intervention, the project was piloted in FY 2022 via the installation of 10 solar panels.

The scope of the project was to do an Impact Assessment of 105 installed solar panels by ICICI Lombard in FY 2023 in underprivileged schools of Mumbai, Patna, and Agartala.

The key highlights of the project are as follows –

Alignment with SDGs

The project closely aligns with key national priority - The **New Solar Power Scheme (for PVTG Habitations/Villages) under PM JANMAN.**

The State Electricity Boards have approved the net -metering and sanctioning for installation of solar panels in about 81% of schools.

42% of schools became sustainable role models for nearby schools, villages and homes.

46% wished to have more solar panels installed in their schools

46% of parents of students liked and acknowledged the intervention

81% of schools are channelising savings from electricity bills in School Welfare

65% of the schools realised the importance of solar energy in their lives

About 83 % of savings in the electricity bills

46% of the schools believed that there has been improvement in the level of quality of education in their schools

54% of schools are supported by panel backup for uninteruppted power supply

81% of schools could save on electricity bills

INR 1.48 social value generated on investment of INR 1

Abbreviations

A	Amperes
AC	Alternative Current
BRSR	Business Responsibility & Sustainability Reporting
CO_2	Carbon Dioxide
CSR	Corporate Social Responsibility
DC	Direct Current
ESG	Environment, Social and Governance
FY	Financial Year
IC	Intangible Costs
IDIs	In-Depth Interviews
ISI	Indian Standards Institute
ISO	International Organization for Standardization
KIIs	Key Informant Interviews
KW	Kilo Watt
KWH	Kilo Watt Hour
MNRE	Ministry of New and Renewable Energy
MSEB	Maharashtra State Electricity Board
NPV	Net Present Value
PID	Potential Induced Degradation
PR	Performance Ratio
SDGs	Sustainable Development Goals
SEBI	Securities & Exchange Board of India
Sq. Ft	Square Feet
SROI	Social Return on Investment
SSY	Solar Specific Yield
TC	Tangible Costs
tCO_2	Total Carbon Dioxide
TI	Total Investment
TOC	Theory of Change
V	Volt
%	Percentage

Chapter 1 :

Overview of project and CSR Initiatives of ICICI Lombard

Chapter 1 - Overview of Project and CSR Initiatives of ICICI Lombard

1.1 Project Background and Overview

India holds significant potential and capacity to harness energy from renewable sources, particularly solar energy. In reality, the country receives about **5,000 trillion kWh per year of energy**, with most regions receiving 4-7 kWh per sqm per day[1]. This abundance presents a tremendous opportunity for leveraging solar electrification to address various electrical needs. Beyond being **environmentally friendly**, it serves as a valuable asset for underprivileged and rural areas where electricity disruptions and high bills are the major concerns.

Need of the Project

Solar electrification not only reduces electricity costs but also contributes to **lowering greenhouse gas emissions and carbon footprints**. It enables **optimal utilisation** of electric appliances, making it a **sustainable and cost-effective solution**. In the context of schools in underprivileged and rural regions, embracing solar electrification can help overcome **challenges associated with power cuts**. This, in turn, facilitates **extended study hours** and greater utilisation of **digital and electrical educational tools**, ultimately enhancing the overall **quality of education** and learning. India possesses considerable potential and capability to produce energy from renewable sources.

About the Project

Recognising and embracing their responsibilities to the community and with the increasing demand for **green energy to combat climate change and promote sustainability**, ICICI Lombard undertook initiatives to promote the generation and usage of renewable energy by communities through the installation of solar panels. As a part of the intervention, the project was piloted in FY 2022 via the installation of 10 solar panels.

The scope of the programme was to do an Impact Assessment of **105 installed solar panels** by ICICI Lombard in FY 2023 in underprivileged schools of Mumbai, Patna, and Agartala.

[1] Solar Overview | Ministry of New and Renewable Energy | India (mnre.gov.in)

1.2 CSR Initiatives of ICICI Lombard

Recognising and embracing its responsibility to communities across India, ICICI Lombard has initiated its CSR interventions. The programmes are oriented towards **preventive healthcare, traffic safety, and disaster relief**, which have provided financial immunity to people in their difficult times. ICICI Lombard constantly encourages and supports **employee voluntarism** year-round. With regard to the same, ICICI Lombard has successfully implemented several projects in coordination with the ICICI Foundation. The projects demonstrate the responsibility of community stakeholders, as well as are aimed at encouraging non-profit humanitarian work to bring positive change in society. The major projects initiated by ICICI Lombard are listed below.

Caring Hands Campaign

- Eye check-up camps for underprivileged children in schools
- Over the last 11 years, ICICI Lombard has reached out to over 2,00,000 students from over 400 schools

Ride to Safety

- To ensure road safety of children and parents, road safety workshops conducted, post which they are provided with ISI marked helmets
- Over 1,65,000+ helmets distributed in last 6 years

Niraniali

- Project was initiated to spread the importance of drinking clean water among underprivileged children.
- Over 800 water purifiers have been installed across schools, benefitting over 4,00,000 students

COVID – 19 relief

- Support by providing lifesaving equipment
- Preventive care and immediate medical support
- Facilitating vaccination of underprivileged citizens
- Healthy villages
- Direct CSR support to Rural Authorized Person

Funding of critical illness

Contributes to treatment of critical illness for underprivileged children/people

Company seeks support from policyholders and works towards matching contribution made during policy purchase

1.3 Alignment with CSR Policy

Schedule VII (Section 135) of the Companies Act, 2013 specifies the list of the activities that can be included by the company in its CSR policy. The below-mentioned table shows the alignments of the intervention with the approved activities by the **Ministry of Corporate Affairs.**

Sub-Section	Activities as per Schedule VII	Alignment with Intervention
(ii)	Promoting education, including special education and employment enhancing vocation skills especially among children, women, elderly, and the differently abled and livelihood enhancement projects.	**Partially** **Uninterrupted power supply** and **decrease in electricity bills** in schools due to solar electrification is improving the quality of education
(iv)	Ensuring environmental sustainability, ecological balance, protection of flora and fauna, animal welfare, agroforestry, conservation of natural resources, and maintaining the quality of soil, air, and water	**Partially** Using solar energy as a resource for school's electricity needs, the project is ensuring **environmental sustainability.**
(ix)	Rural development projects	**Completely** Since the schools involved in the project are in rural and remote areas, this project in a way is supporting and upscaling rural development by **improving the standards of schools.**

1.4 Alignment with Environment, Social and Governance (ESG) Principles and Framework

The project's intervention also aligns with the **ESG Sustainability Report** of the corporate. Particularly, concerning the **Business Responsibility & Sustainability Reporting (BRSR)** Format shared by the **Securities & Exchange Board of India (SEBI),** the project aligns with the principle mentioned below:

PRINCIPLE 2	PRINCIPLE 6	PRINCIPLE 8
Businesses should provide goods and services in a manner that is sustainable and safe	Businesses should respect and make efforts to protect and restore the environment	Businesses should promote inclusive growth and equitable development

1.5 Alignment with National Priorities

The programme intervention of ICICI Lombard is well aligned with a major **National level policy - The New Solar Power Scheme (for PVTG Habitations/Villages) under PM JANMAN.** The below- mentioned Table shows the level of alignment of the project with the policy.

National Priorities	Details of the Priority	Alignment
New Solar Power Scheme under PM JANMAN	• The Scheme focus on eleven critical interventions through the Nine Line Ministries for implementation. • The Mission, inter-alia, covers the implementation of New Solar Power Scheme (for Particularly Vulnerable Tribal Groups (PVTG) Habitations/Villages) with the approved financial outlay of Rs.515 Cr. for electrification of one lakh un-electrified households (HHs) in PVTG areas located in 18 States	**Partially** Solar electrification has been implemented in underprivileged schools having some proportion of tribal students studying.

1.6 Alignment with Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations in 2016 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity.

Sustainable Development Goals (SDGs)	Target	How is it aligned?
	**Goal 4: Quality Education** Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. **Target 4.1** By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes **Target 4.7** By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among	The project has led to **improvement in the quality of education in schools**. Due to **savings in electricity bills and uninterrupted power supply**, there has been an extensive **adoption of digital learning models and tools in schools.** Through this, the students are able to understand the key concepts and learnings in a clearer fashion with better understanding. This is resulting in **improvement in performances and level of engagement in classes** by students. The schools were also able to understand the importance of solar

	others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and culture's contribution to sustainable development.	energy as a renewable energy resource.
	**Goal 7: Affordable and clean energy** Ensure access to affordable, reliable, sustainable and modern energy for all. **Target 7.1** By 2030, ensure universal access to affordable, reliable and modern energy services **Target 7.2** By 2030, increase substantially the share of renewable energy in the global energy mix	The project has led to solar electrification in schools of remote and rural locations **shifting to renewable energy as the resource** for power supply.
	**Goal 12: Responsible consumption and production** Ensure sustainable consumption and production patterns. **Target 12.2** By 2030, achieve the sustainable management and efficient use of natural resources **Target 12.7** Promote public procurement practices that are sustainable, in accordance with national policies and priorities	The intervention is helping in **sustainable consumption of natural resources** by shifting schools towards solar electrification – a renewable energy resource.

	**Goal 13: Climate Action** Take urgent action to combat climate change and its impacts. **Target 13.2** Integrate climate change measures into national policies, strategies and planning	The project has led schools to **shift towards renewable energy resource** which is one of the strategies to combat climate change

Chapter 2 :

Impact Assessment Design and Approach

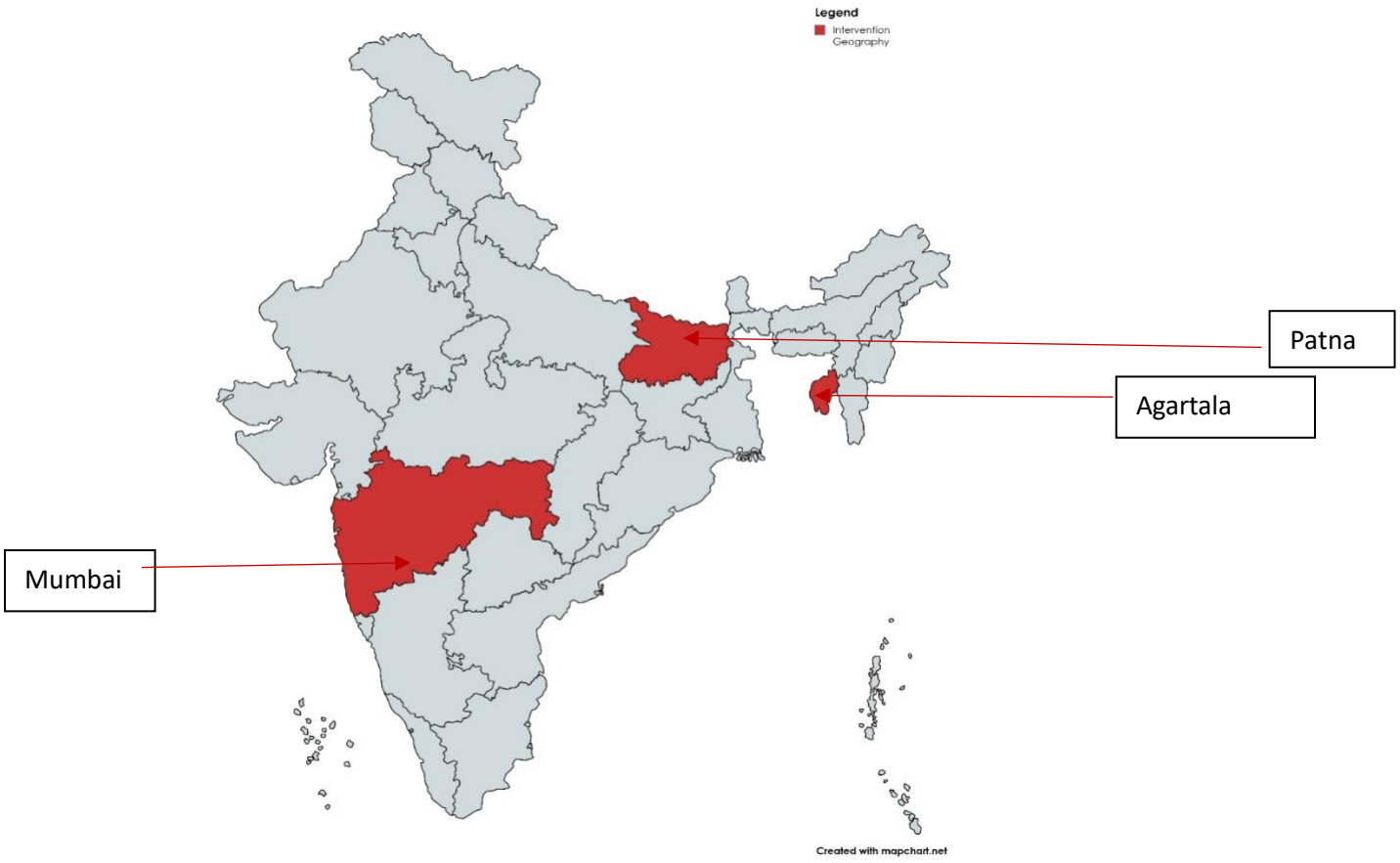
Chapter 2 – Impact Assessment Design and Approach

This section provides an overview of the objectives of the study, the adopted research methodology and other details revolving around the study.

2.1 Objective of the Study

- Assess the extent to which the project has met its objectives, including targets, outputs, and outcomes, as outlined in the project documents.
- Assess the effectiveness, efficiency, impact created and sustainability of the intervention.
- Identify the best practices and processes in the project and give recommendations to address shortcomings, if any.

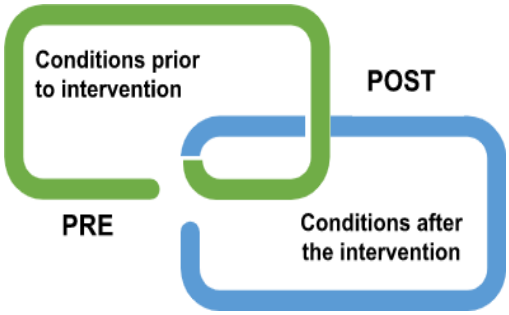
2.2 Geography of the Study



2.3 Evaluation Approach, Methodology and Assessment Framework

Evaluation Approach

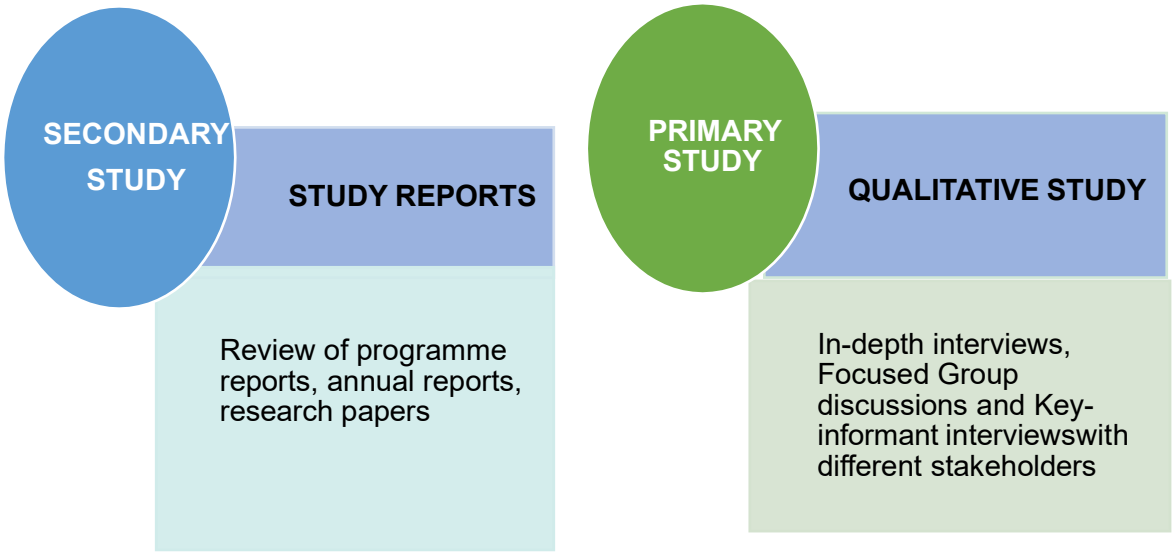
Given the study's objectives and key areas of inquiry, the design of the evaluation focused on learning as the prime objective. In this section, the approach to develop and execute a robust, dynamic, and result-oriented evaluation framework/design is presented.



To measure the impact, the study adopted a **pre-post- programme evaluation approach**. This approach relies on the recall capacity of the respondents, where beneficiaries were queried about conditions before and after the programme intervention. The observed differences aided in understanding the programme's contribution to improving the intended conditions of the beneficiaries. While this approach can provide insights into the programme's contribution to improving living standards, it may not fully attribute all changes solely to the programme.

Methodology

For the assessment of the programme, a two-pronged approach was employed for data collection and review, including secondary data sources, literature, and primary data obtained from qualitative methods of data collection.The figure below illustrates the study approach used in data collection and review. The **secondary study** involved a review of annual reports, monitoring reports, programme documentation, consultation calls with the implementing team and research by renowned organisations available in the public domain to draw insights into the situation of the area.



The **primary study** comprised qualitative approaches to data collection and analysis. It involved **indepth interviews (IDIs) and Key-informant interviews** with the stakeholders, like the Technical Vendors, School Teachers and Headmasters, School Management Committee and Board, Panel Maintenance Staff, Students, implementing partners and ICICI Lombard CSR Team. In addition to primary data collection,the consultants also studied various project documents as shared and other relevant reports/literature related to the projects. The consultants also studied project implementation-related documents, specifying details of activities carried out, processes undertaken, and number of beneficiaries reached.

Assessment Framework

To determine the relevance, efficiency, coherence, effectiveness, impact and sustainability of the project, the evaluation used the **OECD-DAC Framework**. Using the OECD-DAC framework, the evaluation was able to assess the ICICI Lombard CSR Team's contribution to the results while keeping in mind the multiplicity of factors that might have affected the overall outcome. The social impact assessment hinges on the following pillars:

CSRBOX created a framework for **Social Return on Investment (SROI)** analysis of the project. The following diagram gives an overview of the SROI evaluation:

Approach	
1	Value creation through the project
2	Define financial proxies for impact returns
3	Forecast SROI for values of project centric activities
4	SROI forecast for individual beneficiaries
5	Extrapolate of the values for quantified social values

Elements Covered	
1	Mapping outcome and impact against indicators
2	Establishing scope and identifying stakeholders
3	Develop Narrative to understand and maximise the social value
4	Managing unexpected outcomes
5	Demonstrating the importance of working with other organisations

SROI will help in understanding the social impact of the programmes on the community. While it is easy to measure the return on investment of an intervention through methods such as cost-benefit analysis, etc. It is difficult to impute the value of outcomes for an intervention. However, there are methods which help in imputing values to outcomes. It is a framework to measure and account for the value created by a programme or series of initiatives beyond financial value. It incorporates **social, health, environmental and economic costs and benefits**. SROI basically looks at the cost which would had been incurred if the intervention was not been made.

The usual stages of SROI analysis include:

(i) Establishing scope and identifying key stakeholders;

(ii) Mapping project outcomes with the stakeholders using the theory of change;

(iii) Assigning a financial value to the project outcomes;

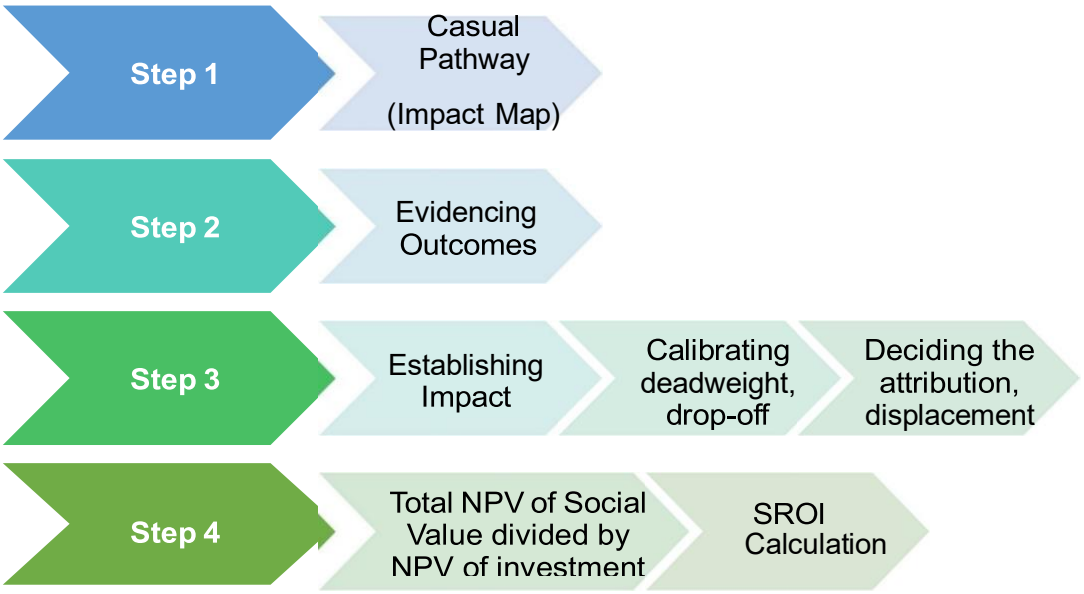
(iv) Establishing project impact from the project end line evaluation;

(v) Calculating inputs to the project;

(vi) Calculating the SROI

It is calculated by adding the **tangible costs (TC)** and **intangible costs (IC)** to the **total investment (TI)** made.

$$SROI = (TC + IC)/TI$$



Evaluative SROI is estimated. The following data/ information was collected:

1. Program Cost
2. Overheads and administrative cost
3. Non tangible cost[2]

[2] Appendix-SROI-methodology_ENG.pdf (undp.org)
The-SROI-Guide-2012.pdf (squarespace.com)
(PDF) Social Return on Investment (SROI): a review of the technique (researchgate.net)

The final stage involves adding all the benefits, subtracting any negatives (direct expenses) and comparing the result to the investment. This is also where the sensitivity of the results will be tested. Since the investment and outcomes have happened over the years, to calculate the SROI, the values for the previous years are converted to the **Net Present Value (NPV)**. After the values for both investment and returns are converted to NPV, SROI is calculated by dividing the **NPV of benefits** by the **NPV investments** made.

2.4 Sampling

Geographic Sampling

S.No.	Location	No. of Schools	% of universe	Sample
1.	Raigarh	28	27%	8
2.	Palghar	38	36%	10
3.	Patna	5	5%	2
4.	Mumbai (including Sub City)	4	4%	1
5.	Thane	25	24%	3
6.	Agartala	5	5%	2
	Total	105	100%	26
	Survey Sample was 26 schools			

Qualitative Sampling

Detailed interaction with the key stakeholders were conducted to get detailed insights into the impact of the project.

The data was collected from the following stakeholders:

S.No.	Stakeholders	Mode of Data Collection	No. of Interviews/School
1.	School Teachers	In-depth Interviews	1
2.	School Headmaster	In-depth Interviews	1
3.	School Board / Management Committee	Key Informant Interviews	1
4.	Technical Vendors	In-depth Interviews	1

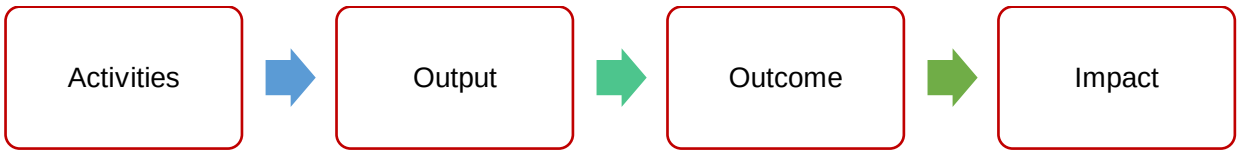
5.	Maintenance Personnel	In-depth Interviews	1
6.	Students	Focused Group Discussions	24
7.	Implementation Partners (Seva Sahyog Foundation & Indian Head Injury Foundation)	Key Informant Interviews	
8.	ICICI Lombard CSR Team	Key Informant Interviews	

*Total interactions varied based on the availability of stakeholders and number of interactions were decided as per interactionswith the ICICI Lombard CSR team and Implementing Team

Limitations to the Study

- Assessment couldn't be conducted in some schools as the interactions were happening during the peak examination period, and hence, they were unavailable for the interaction.
- Since most of the interactions were virtual, a few schools were unresponsive towards calls and were not willing to be part of the interaction.
- Few schools did not have a basic understanding of the project, which created a challenge in data collection.
- The data collected for carbon emissions accounting from schools had a lot of gaps due to a lack of understanding and awareness of the questions asked about the data among schools.

2.5 Theory of Change



Activities	Output	Outcome	Impact
Solar Electrification of underprivileged schools	• 1 KW backup available for panels • Backup supporting schools in power cuts for 7-8 Hrs • Annual savings of about 33600 on electricity bills • Borewells/ Submersibles used for cleaning of panels in schools	• Optimal utilis ation of electrical appliances in power cuts • Decrease in electricity expense by schools • Increase in electricity consumption patterns • Increase usage of digital tools for learning. • Improvent in education performances of students • Increase dependence on Solar energy source • Increased access to digital education	• Reduction in carbon emissions from schools. • Improvement in quality of education from schools. • Uninterrupted power supply • Savings on electricity bills • Electricity savings from schools are channelised to school welfare
Sanctioning of Loads and net metering in Schools	Upgradation of load capacity to 5KW, from existing 2-3KW		

Chapter 3 :

Impact Findings

Chapter 3 - Impact Findings

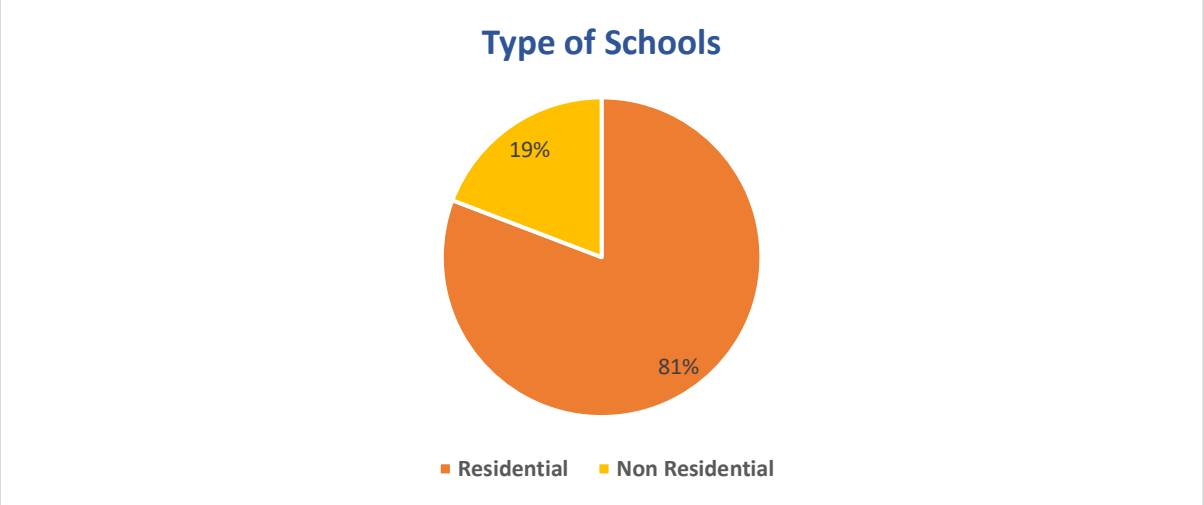
3.1 Impact Findings

CSRBOX followed the criteria of the **OECD Development Assistance Committee (DAC) Evaluation System** for international development projects based on relevance, effectiveness, efficiency, impact, sustainability, and coherence. These assessments aim to ensure that projects align with actual needs, achieve intended goals, utilise resources efficiently, have lasting positive effects, and harmonise with broader development strategies. The evaluation process enhances accountability, informs decision-making, and facilitates continuous improvement in international development efforts.

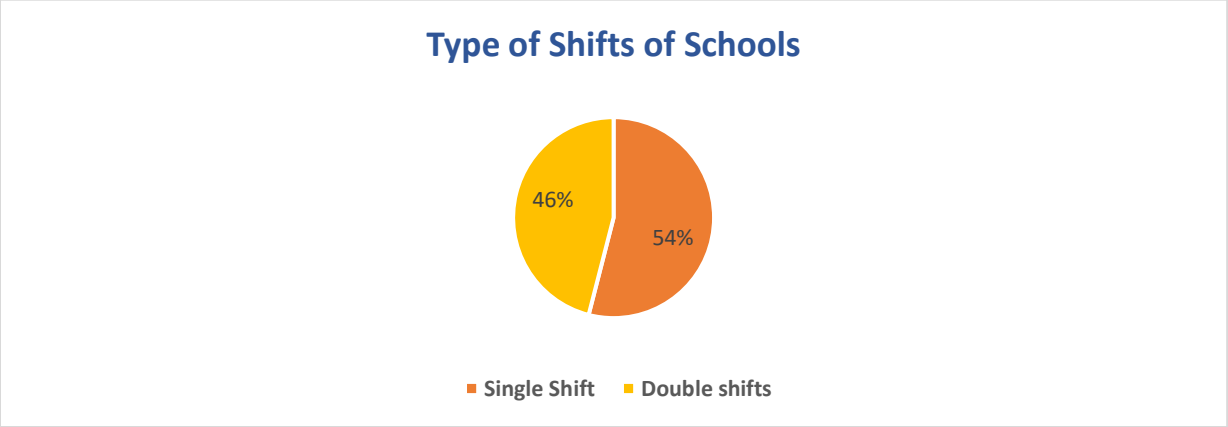
3.1.1 Relevance

School Operations

The schools are in remote areas of Mumbai, Patna and Agartala. **About 81 % of the schools are Non-Residential** (Non – Ashram/ Hostel Schools), and **19 % of the schools are Residential (Ashram/ Hostel Schools).**



54% of these schools operated in single shifts and the remaining **46% operated** in double shifts.



Frequent Power Cuts

Since all the schools are in remote areas, the teachers reported to have **frequent episodes of power cuts** for prolonged duration. In Mumbai, once a week, a complete power shutdown happens in schools for maintenance work, which lasts for almost a complete day. In Patna and Agartala, power cuts happen almost daily for about 7-8 hours. In monsoons, the problem even escalates for about 3-4 days.

Such frequent power cuts **hampered school activities and education for students**. Moreover, before the project was implemented, the electricity bills of the schools (especially residential schools due to high electricity demands) were very **expensive**. The schools are in **remote areas and are financially weak**. Hence, it was difficult for the schools to clear those electricity bills, and hence those bills remained pending.

'We used to study under the Candlelight or the Diya Light before the intervention'

– Ujwala, Student, Kasturba Gandhi Balika Vidyalaya Vikramgad, Malwada, Mumbai

Compromise with Quality of Education

Additionally, the students felt that the **access to digital learning was hindered**, leading to difficulties in comprehending concepts and prolonged learning times. Studying under candlelight and oil lamps was a common practice before the intervention.

'Before the project, we didn't have the digital learning resources'

– Aruna, Student, Kasturba Gandhi Balika Vidyalaya Vikramgad, Malwada, Mumbai

Need of the Project

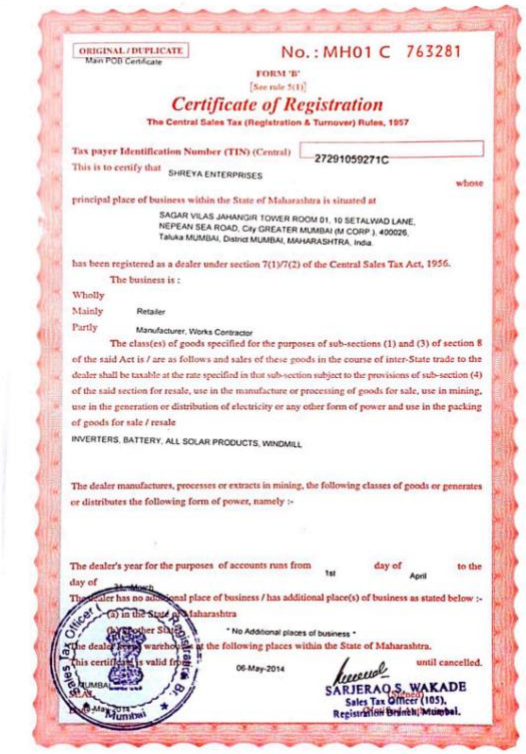
Therefore, this project was needed to significantly **reduce the school's electricity bills** and provide an **uninterrupted power supply** to maintain continuity in student's education. This will help them to **channel their savings from electricity bills towards other schools' welfare** needs such as stationery, management and administration, exam fees for students who are economically weak and supporting and sponsoring education for students (especially tribal students).

Frequent Power Cuts for prolonged durations	High expenses towards Electricity Bills	Hampering of Education and School Activities	Less access to Digital Education and Learning

3.1.2 Coherence

Panel Registration

The solar panels installed in schools are all **Ministry of New and Renewable Energy/ ISO certified** and approved. Below are the registration certificates for the solar panels installed in schools. The technical teams and implementation team virtually stay in regular contact and touch with all the schools where they have installed the solar panels.



The State Electricity Boards have approved the net -metering and sanctioning for installation of solar panels in about 81% of schools.

The project closely aligns with key national priority - The **New Solar Power Scheme (for PVTG Habitations/Villages) under PM JANMAN.**

Alignment with SDGs

Alignment with ESG Principles

PRINCIPLE 2	PRINCIPLE 6	PRINCIPLE 8
Businesses should provide goods and services in a manner that is sustainable and safe	Businesses should respect and make efforts to protect and restore the environment	Businesses should promote inclusive growth and equitable development

3.1.3 Effectiveness

Panel Power Backup

54% of schools are supported by panel backup, which provides them with an uninterrupted power supply. Since the backup provided is of **low capacity** (about 1KW), it only supports some specific main rooms in the schools, such as the Principal's office, Admin Office, Halls and Labs. **For 8% of schools, the backup is supporting the complete school**. The power backup of panels can withstand and support longer power cuts through the guidance of the technical team instructing the schools as to how optimal utilisation of electrical appliances can be undertaken. The technical team guides and trains the schools in **optimal usage** of some

specific electrical appliances for some specific duration depending on their energy consumption pattern and not to use all appliances together to prevent early drainage of the battery backup.

About 83 % of savings in the electricity bills

46% of the schools believed that there has been improvement in the level of quality of education in their schools

54% of schools are supported by panel backup for uninteruppted power supply

81% of schools could save on electricity bills

88.5% of schools responded that the Panels are working properly

Improvement in Quality of Education

46%schools believed there has been improvement in the level of quality of education in their school mainly because of the extensive use of **digital tools, smart classes, smart TVs and digital learning models** and concepts. The students are able to relate and start to develop a **deeper understanding of key concepts of learning**. The visuals help students deep dive and clearly grasp the learning. There has been improvement in their results as well as in the **level of engagement in the classes.** They like to come to school and are enjoying the learning process and journey. They are fascinated towards the usage of digital tools such as - projectors, smart TVs, computers, and tablets. **About 11.5% of schools** are on the verge of starting the digital education model and concept in their school.

'Before the project, power cuts affected student's education. It was difficult for students to study in summers. Digital learning was also hampered. But now, after the project, digital learning is extensively used and quality of education has improved.'

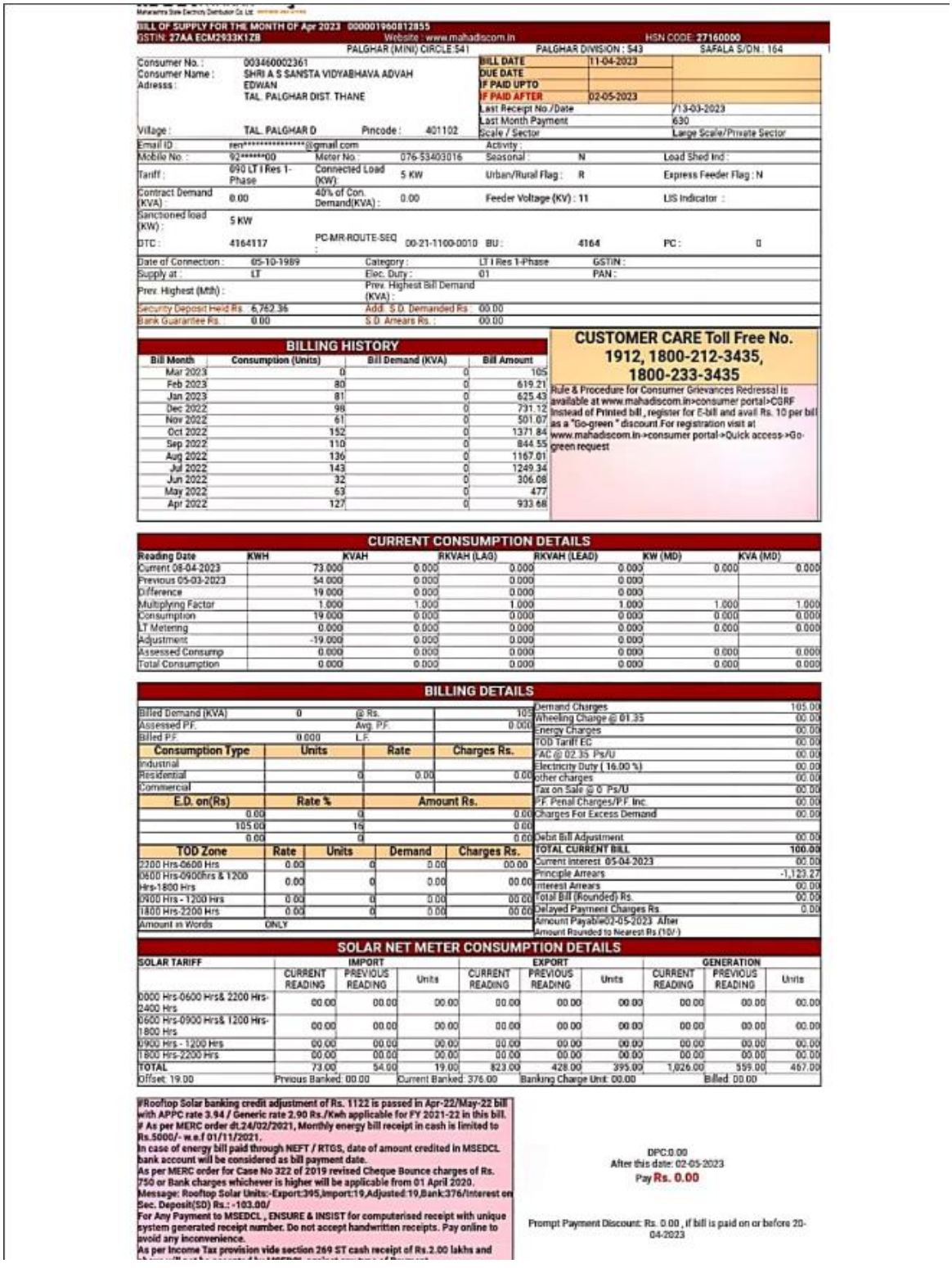
– Ashok Kumar Sharma, Teacher
GD Patliputra Senior Secondary School, Patna

'Because of the project, digital learning tools are being extensively used. Smart TVs, projectors and computers are being used more. Students are enjoying and liking to come to school. Parents are also liking this initiative. The visuals through digital learning are improving the quality of education.'

- *Vinayaka, Gulavani, Headmaster*
  Nutan Madhyamik Vidyalaya, Raigad, Mumbai

Savings on Electricity Bills

81% of schools could save on electricity bills due to the completion of load-sanctioning and net metering of panels in schools. Load Sanctioning, on average, took a lot of time (about 2-4 months) due to delays in responses and approvals from electricity boards. The implementing partners said that it is mainly because the electricity boards do not consider such issues in their priority areas.



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PALGHAR (MINI) CIRCLE:541 PALGHAR DIVISION : 543 SAFALA S/DN.: 164

Consumer No. :	003460002361			BILL DATE	11-04-2023		
Consumer Name :	SHRI A S SANSTA VIDYABHAVA ADVAH			DUE DATE			
Adresss :	EDWAN			IF PAID UPTO			
	TAL. PALGHAR DIST. THANE			IF PAID AFTER	02-05-2023		
				Last Receipt No./Date		/13-03-2023	
Village :	TAL. PALGHAR D	Pincode :	401102	Last Month Payment		630	
				Scale / Sector		Large Scale/Private Sector	
Email ID :	ren**********@gmail.com			Activity :			
Mobile No. :	92******00	Meter No. :	076-53403016	Seasonal :	N	Load Shed Ind :	
Tariff :	090 LT I Res 1-Phase	Connected Load (KW) :	5 KW	Urban/Rural Flag :	R	Express Feeder Flag : N	
Contract Demand (KVA) :	0.00	40% of Con. Demand(KVA) :	0.00	Feeder Voltage (KV) : 11		LIS Indicator :	
Sanctioned load (KW) :	5 KW						
DTC :	4164117	PC-MR-ROUTE-SEQ :	00-21-1100-0010	BU :	4164	PC :	0
Date of Connection :	05-10-1989	Category :		LT I Res 1-Phase	GSTIN :		
Supply at :	LT	Elec. Duty :		01	PAN :		
Prev. Highest (Mth) :		Prev. Highest Bill Demand (KVA) :					
Security Deposit Held Rs.	6,762.36	Add. S.D. Demanded Rs.	00.00				
Bank Guarantee Rs.	0.00	S.D. Arrears Rs. :	00.00				

BILLING HISTORY

Bill Month	Consumption (Units)	Bill Demand (KVA)	Bill Amount
Mar 2023	0	0	105
Feb 2023	80	0	619.21
Jan 2023	81	0	625.43
Dec 2022	98	0	731.12
Nov 2022	61	0	501.07
Oct 2022	152	0	1371.84
Sep 2022	110	0	844.55
Aug 2022	136	0	1167.01
Jul 2022	143	0	1249.34
Jun 2022	32	0	306.08
May 2022	63	0	477
Apr 2022	127	0	933.68

CUSTOMER CARE Toll Free No. 1912, 1800-212-3435, 1800-233-3435

Rule & Procedure for Consumer Grievances Redressal is available at www.mahadiscom.in>consumer portal>CGRF
Instead of Printed bill , register for E-bill and avail Rs. 10 per bill as a "Go-green " discount.For registration visit at www.mahadiscom.in->consumer portal->Quick access->Go-green request

CURRENT CONSUMPTION DETAILS

Reading Date	KWH	KVAH	RKVAH (LAG)	RKVAH (LEAD)	KW (MD)	KVA (MD)
Current 08-04-2023	73.000	0.000	0.000	0.000	0.000	0.000
Previous 05-03-2023	54.000	0.000	0.000	0.000		
Difference	19.000	0.000	0.000	0.000		
Multiplying Factor	1.000	1.000	1.000	1.000	1.000	1.000
Consumption	19.000	0.000	0.000	0.000	0.000	0.000
LT Metering	0.000	0.000	0.000	0.000	0.000	0.000
Adjustment	-19.000	0.000	0.000	0.000		
Assessed Consump	0.000	0.000	0.000	0.000	0.000	0.000
Total Consumption	0.000	0.000	0.000	0.000	0.000	0.000

BILLING DETAILS

Billed Demand (KVA)	0	@ Rs.	105
Assessed PF		Avg. PF	0.000
Billed PF	0.000	L.F.	

Consumption Type	Units	Rate	Charges Rs.
Industrial			
Residential	0	0.00	0.00
Commercial			

E.D. on(Rs)	Rate %	Amount Rs.
0.00	0	0.00
105.00	15	0.00
0.00	0	0.00

TOD Zone	Rate	Units	Demand	Charges Rs.
2200 Hrs-0600 Hrs	0.00	0	0.00	00.00
0600 Hrs-0900Hrs & 1200 Hrs-1800 Hrs	0.00	0	0.00	00.00
0900 Hrs - 1200 Hrs	0.00	0	0.00	00.00
1800 Hrs-2200 Hrs	0.00	0	0.00	00.00

Amount in Words ONLY

Demand Charges	105.00
Wheeling Charge @ 01.35	00.00
Energy Charges	00.00
TOD Tariff EC	00.00
FAC @ 02.35 Ps/U	00.00
Electricity Duty (16.00 %)	00.00
other charges	00.00
Tax on Sale @ 0 Ps/U	00.00
PF Penal Charges/PF Inc	00.00
Charges For Excess Demand	00.00
Debit Bill Adjustment	00.00
TOTAL CURRENT BILL	**100.00**
Current Interest 05-04-2023	00.00
Principle Arrears	-1,123.27
Interest Arrears	00.00
Total Bill (Rounded) Rs.	00.00
Delayed Payment Charges Rs.	0.00
Amount Payable@02-05-2023 After Amount Rounded to Nearest Rs (10/-)	

SOLAR NET METER CONSUMPTION DETAILS

SOLAR TARIFF	IMPORT			EXPORT			GENERATION		
	CURRENT READING	PREVIOUS READING	Units	CURRENT READING	PREVIOUS READING	Units	CURRENT READING	PREVIOUS READING	Units
0000 Hrs-0600 Hrs& 2200 Hrs-2400 Hrs	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00
0600 Hrs-0900 Hrs& 1200 Hrs-1800 Hrs	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00
0900 Hrs - 1200 Hrs	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00
1800 Hrs-2200 Hrs	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00
TOTAL	73.00	54.00	19.00	823.00	428.00	395.00	1,026.00	559.00	467.00

Offset 19.00 Previous Banked: 00.00 Current Banked: 376.00 Banking Charge Unit: 00.00 Billed: 00.00

#Rooftop Solar banking credit adjustment of Rs. 1122 is passed in Apr-22/May-22 bill with APPC rate 3.94 / Generic rate 2.90 Rs./Kwh applicable for FY 2021-22 in this bill.
 # As per MERC order dt.24/02/2021, Monthly energy bill receipt in cash is limited to Rs.5000/- w.e.f 01/11/2021.
In case of energy bill paid through NEFT / RTGS, date of amount credited in MSEDCL bank account will be considered as bill payment date.
As per MERC order for Case No 322 of 2019 revised Cheque Bounce charges of Rs. 750 or Bank charges whichever is higher will be applicable from 01 April 2020.
Message: Rooftop Solar Units:-Export:395,Import:19,Adjusted:19,Bank:376/Interest on Sec. Deposit(SD) Rs.: -103.00/
For Any Payment to MSEDCL , ENSURE & INSIST for computerised receipt with unique system generated receipt number. Do not accept handwritten receipts. Pay online to avoid any inconvenience.
As per Income Tax provision vide section 269 ST cash receipt of Rs.2.00 lakhs and

DPC:0.00
After this date: 02-05-2023
Pay **Rs. 0.00**

Prompt Payment Discount: Rs. 0.00 , if bill is paid on or before 20-04-2023

Average Carbon Emission Accounting per school – Pre and Post Intervention[3]

Pre-Intervention

Particulars	Value	Data Source	Units
Average Monthly Cost of Electricity Bills per school (	Rs. 3,100	Stakeholder interactions	Rs
Unit Electricity Cost[4]	575 Paise = 5.75 Rs.	Secondary Data	Rs.
Average Monthly Net Electricity Consumption (from Coal) per school	3,100 / 5.75 = 539	Secondary Data	KWH
Carbon emission per KWH of electricity generated[5]	820 grams = 0.82 Kgs	Secondary Data	Kg
Carbon emission per school per month	539 x 0.82 = **442 Kgs of Carbon emission**	Secondary Data	Kg

442 Kgs of carbon emission in the atmosphere per school per month *before the intervention.*

Post Intervention

Particulars	Value	Data Source	Units
Average Monthly Cost of Electricity Bills	Rs. 2800	Stakeholder interactions	Rs
Unit Electricity Cost[6]	575 Paise = 5.75 Rs.	Secondary Data	Rs.
Average Monthly Net Electricity Consumption (from Solar Electrification)	2800/5.75 = 487	Secondary Data	KWH
Electricity Units generated from Coal post intervention	539 – 487 = 52	Secondary Data	KWH
Per cent reduction in Carbon emissions from Solar Panel installed[7]	20 % = 0.2 = 1-0.2 = 0.8	Secondary Data	Kg
Carbon emission per KWH of electricity generated[8]	820 grams = 0.82 Kgs	Secondary Data	Kg
Carbon emission per school per month	(0.82 x 487 x 0.8) + (0.82 x 52) = **362 Kgs**	Secondary Data	Kg

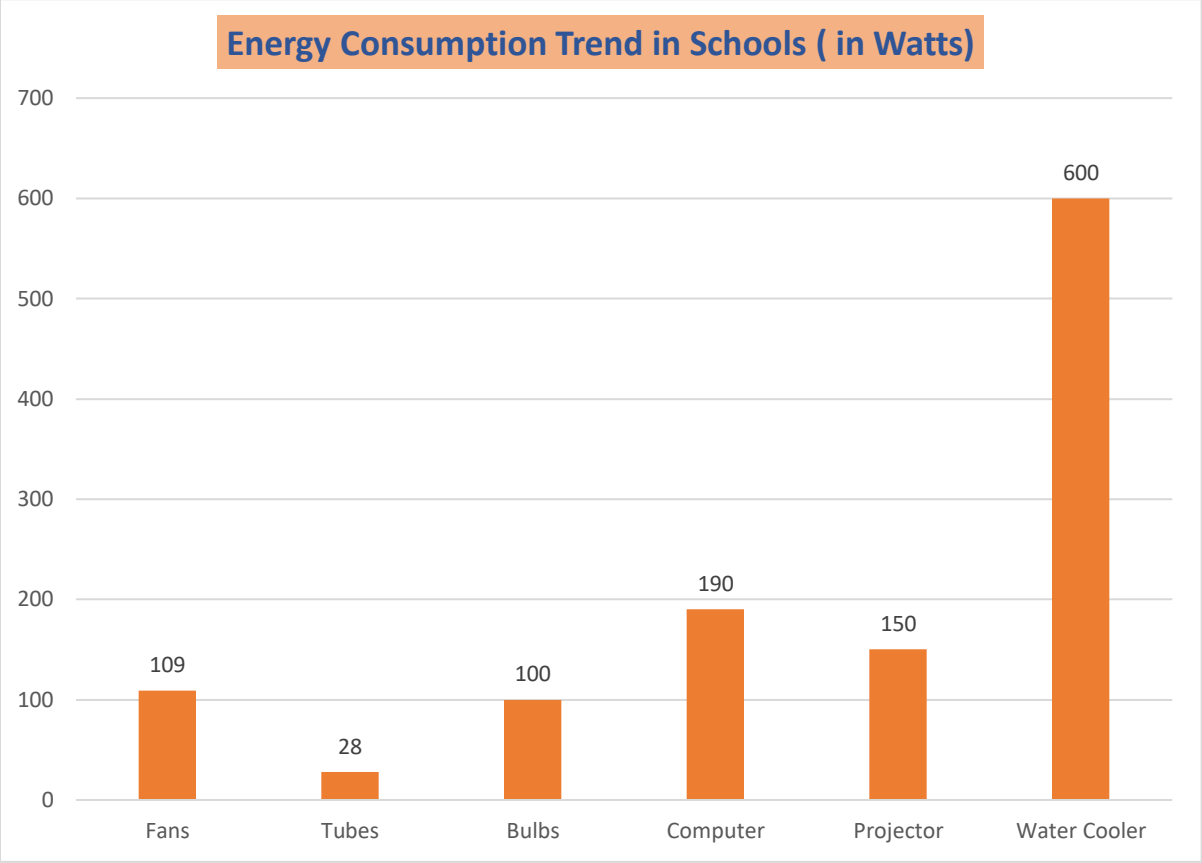
362 Kgs of carbon emissions in the atmosphere per school per month *after the intervention.*

Carbon Emission removal per school per month from the intervention = 442 – 362 **= 80 Kgs**

% of Carbon emission removal per school per month from the intervention = 362 / 442 x **100 = 82 %**

[4] Tariff-Booklet-low-may07.pdf
[5] Electricity Generation and CO2 Emissions | Planète Énergies (planete-energies.com)
[6] Tariff-Booklet-low-may07.pdf
[7] Solar Photovoltaics - Cradle-to-grave analysis and environmental cost. (renewableenergyhub.co.uk)
[8] Electricity Generation and CO2 Emissions | Planète Énergies (planete-energies.com)

The intervention resulted in the removal of 80 Kgs or 82 % of Carbon emission from the atmosphere per school per month.



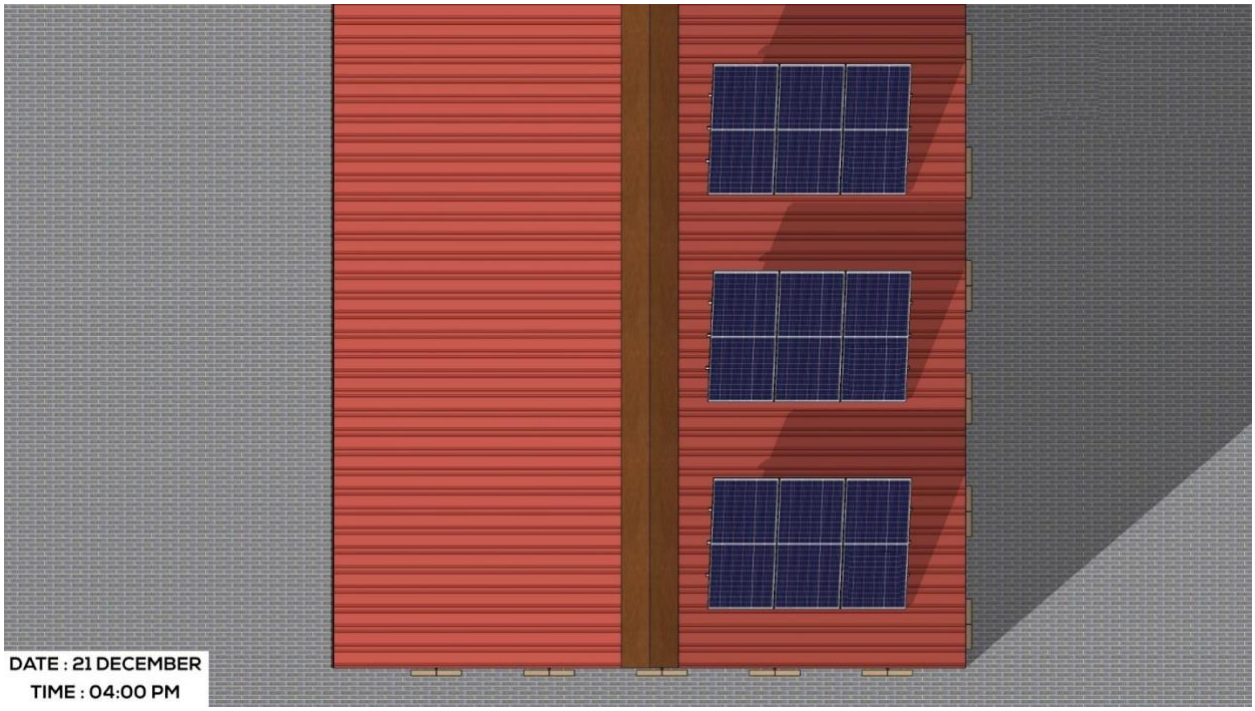
3.1.4 Efficiency

The panels used were **on grid systems**, which, out of the total consumption capacity, utilise the desired amount of energy consumption units and the surplus units are being shared back with the Department of Electricity for storage. Through this approach, the **electricity bills for schools are compensated/ discounted** in scenarios where the energy utilisation by panels turns out to be more than the capacity limit of the panel. This compensates for the surplus energy units. Hence, these panels become really useful and helpful in terms of long power cuts, especially during monsoons.

Panel working

The cells of the panel consist of silicon, composed of electrons and protons, which generate current, enabling the panel to function. Sunlight is essential for all panels, as photons trigger the cells, resulting in energy generation. Each cell of the panel generates some power, which is given to the inverter that converts DC Power into usable domestic AC power. Cells are connected in series and panels.

Overall, panels work for 6 hours, i.e., they require 6 hours of the shadow-free area, and the remaining 10 hours (non-sunlight hours) use the energy stored in the earlier 6 hours (sunlight hours). The shadow analysis report for this is also shared and monitored regularly to have a greater understanding of the sunlight incident on panels. Normally, 1 KW of panel produces approximately 2 units per day, but with proper maintenance, it can produce 3 - 5 units per day.



Panel Safety

Switch gears are provided to ground the high voltage energy as DC for safety (through DC Side earthing). The protection device is installed in inverters. A **lightning arrest facility** is provided. If high electricity current as AC comes from an electricity board, that is also grounded through earthing. In cases of mishap, **fire extinguishers** are present in schools. They have the **basic first aid kit,** and teachers of a few schools are even **first aid trained.**

The following **Technical Parameters** were considered while installing the solar panels in schools–

1. **South Direction** considered
2. No object should be in near proximity. The panel should be in a very secure place.
3. **No high-tension light** to pass the panel
4. **Area for 1 kw - approx. 80 sq ft** should be available

5. Roof material should have a **tin sheet and not a cement sheet** on which the panel can be installed

6. **Health and Safety and easy accessibility to school roofs and water source** for cleaning purposes

Basic Technical Details Summary for Solar Panels installed

Mumbai

Capacity Utilisation Factor	For 1 Day 20kWh
Warranty	27-year power output warranty ,12 Years manufacturing defects warranty
Type of Panel	Monocrystalline Half cut Perc Technology-144Cell Bifacial
Load	5Kw
Soiling Loss	5%-15% (according to Mumbai region, also depends frequency of cleaning solar panel if not cleaned till 1Week then 5% and if not cleaned till 1 Month 15%)
Soiling Ratio	Varies from season to season and location to location, but it is typically between 0%/Day and 1%/Day
Transmission Loss	20% Approximately
Shading	Installed it in shadow free area
Effect of shading on generation of PV panel	No Effect as we installed it in shadow free area
Formation of Hotspot in a Module	As there is no shading on entire solar panels, also each and every module was tested in laboratory of manufacturing unit so there are minimal chances of internal cell defects and mismatch in solar cell till installations, so there is no Formation of Hotspot in a Module
Incident Angle	18 degrees to 22 Degree
Position of PV panel	In South Direction
Module Temperature	Operating Temp Range -40 to 85 Deg Cel.
Potential induced degradation (PID)	Encapsulate is PID free
Open Circuit Voltage	46.50V
Short Circuit Current	11.16A
Current Voltage	10.77A/ 38.50V
Performance Ratio (PR)	100% at STC & Up to 80% at NOCT
Characteristic of Solar Module	72 Cells are cut in half having 144 Cell in a solar module
Total Number of inverters	1Nos
Strings per inverter	1Nos -Single MPPT
Inverter Power	5Kw On-grid

Solar Area Breakup Details (Ha) - **PV Module Area** **Balance of Plant** **Open Area** **Total Area**	450SQFT
Solar Module Parameters (MLD) - **a) No. of Solar module** **b) Area of individual module** **c) Water Required to clean each module** **d) Number of cycles per year** **e) Total Water Requirement,**	a) 9 Nos, b) 1.12M x 2.23M, c) 30Lt., d) 30cycle, e) 780 Lt.
Power Evacuation Process	Evacuated at School LT Panel (Cutout)
Type and Module of PV	144cell Mono Perc Half cut -Bifacial Technology ,540Wp
Plant Load Factor (%)	20%
Permits and approval	From MSEB
Time of Installation	1 Day
Certification	MNRE/ ISO Certified and Approved

Patna

Capacity Utilisation Factor	For 1 Day 20kWh
Warranty	27-year power output warranty,12 Years manufacturing defects warranty
Type of Panel	Monocrystalline Half cut Perc Technology-144Cell Bifacial
Load	5Kw
Soiling Loss	5%-15% (according to Patna region, also depends on frequency of cleaning solar panels if not cleaned till 1Week then 5%, and if not cleaned till 1 Month 15%)
Soiling Ratio	Varies from season to season and location to location, but it is typically between 0%/Day and 1%/Day
Transmission Loss	20% Approximately
Shading	Installed it in shadow free area
Effect of shading on generation of PV panel	No Effect as we installed it in shadow free area

Formation of Hotspot in a Module	As there is no shading on entire solar panels, also each and every module was tested in the laboratory of the manufacturing unit so there are minimal chance of internal cell defects and mismatches in solar cells till installation, so there is no Formation of Hotspot in a Module
Incident Angle	18 degrees
Position of PV panel	In South Direction
Module Temperature	Operating Temp Range -40 to 85 Deg Cel.
Potential induced degradation (PID)	Encapsulate is PID-free
Open Circuit Voltage	46.50V
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Power Evacuation Process	Evacuated at School LT Panel (Cutout)
Type and Module of PV	144cell Mono Perc Half cut -Bifacial Technology ,540Wp
Plant Load Factor (%)	20%
Permits and approval	From Bihar Discom
Time of Installation	1 Day
Certification	MNRE/ ISO Certified and Approved

Agartala

Capacity Utilisation Factor	For 1 Day 20kWh
Warranty	27-year power output warranty,12 Years manufacturing defects warranty
Type of Panel	Monocrystalline Half cut Perc Technology-144Cell Bifacial
Load	5Kw
Soiling Loss	5%-15% (according to Agartala region, also depends on the frequency of cleaning solar panels if not cleaned till 1Week then 5%, and if not cleaned till 1 Month 15%)
Soiling Ratio	Varies from season to season and location to location, but it is typically between 0%/Day and 1%/Day
Transmission Loss	20% Approximately
Shading	Installed it in shadow-free area
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Power Evacuation Process	Evacuated at School LT Panel (Cutout)
Type and Module of PV	144cell Mono Perc Half cut -Bifacial Technology ,540Wp
Plant Load Factor (%)	20%
Permits and approval	From Fedco and Tripura Discom
Time of Installation	1 Day
Certification	MNRE/ ISO Certified and Approved

Key Terms Glossary[9]

Soiling Loss - Losses due to soiling (dust or snow and bird droppings, etc.) on the modules for long periods, and depending on the environmental conditions, rainfall frequency, and cleaning strategy37an impact the performance ratio.

Soiling Ratio – For a completely clean panel, the SR is 100 % and for a soiled panel, it is closer to 0 %.

Transmission Loss - Transmission loss is the loss of transmission of solar irradiation to the solar module. Dust deposited on the module reduces the light transmission, and hence, the incident solar irradiation decreases. Reduced incident radiation may slow down the temperature enhancement of the PV panels. Thus, the open-circuit voltage is not much affected.

$$Transmission\ Loss\ (\%) = 100 - Soiling\ ratio\ (\%)$$

Shading effect - Shading occurs due to mountains, buildings, or any cause on rows or columns of cells in a module permanently or temporarily, reducing the output power significantly. This may loss cause a hotspot in the cell and may damage the module. When an entire panel is under shadows or in the shade, it simply stops generating power. However, if the panel is under partial shading, then the power generation depends on the orientation of the panel and shadow area.

Hotspot Formation - Hotspot formation refers to a localised heating condition within a PV module, which may occur due to a mismatch in solar cells, partial shading or internal cell defects.

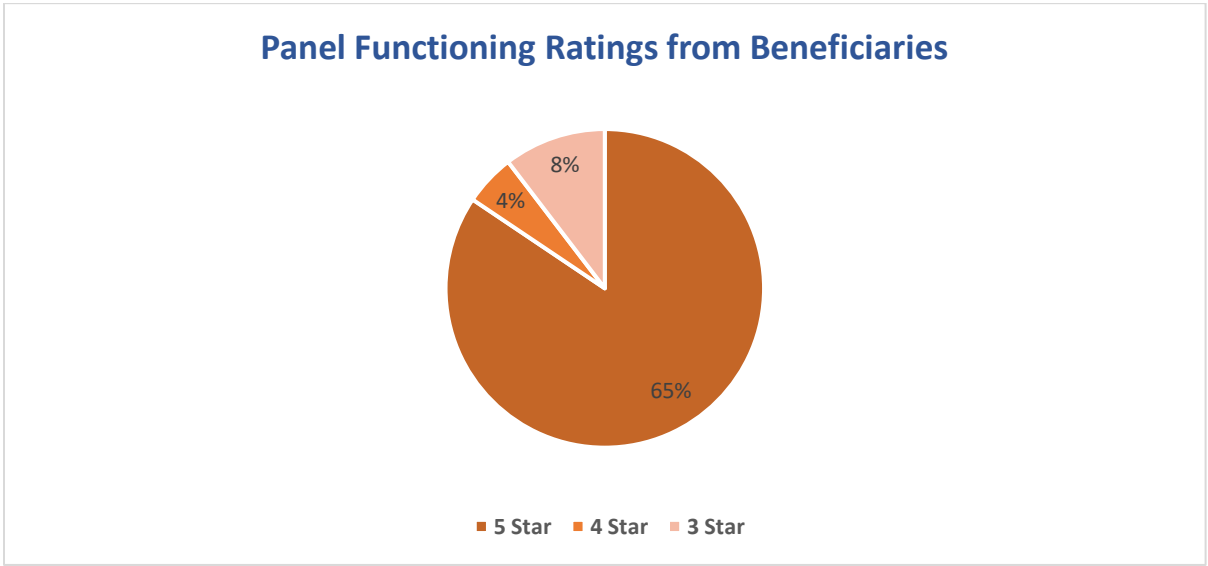
[9] 14_Booklet on Factors affecting efficiency of Solar plants and Ways to improve(1).pdf (indianrailways.gov.in)

Incident Angle - This is the angle between the line that points to the sun and the line that is normal to the surface of the panel. Solar panels are most efficient when pointing perpendicular to the sunlight.

Position of PV Panel - It is crucial to position the PV panels to capture solar irradiation for the maximum duration throughout the day. Ideally, PV panels should face south or south-south-facing direction, as the sun rises in the east and moves towards the south before setting in the west.

Module Temperature - For every degree rise in Celsius temperature above 25-degree Celsius, crystalline silicon modules reduce inefficiency and vice versa.

Potential Induced Degradation (PID) - Whenever a conductive path is formed between cell and frame through encapsulation, glass, or back sheet, a leakage current will flow from cell to earth. This is known as PID.



3.1.5 Impact

Schools becoming Role Models

42% of schools have responded that the nearby schools, homes and villages in the near vicinity have shown interest in installing panels in their respective homes/ schools. They have

been inspired by the school's sustainable model and have asked them about the process and have even submitted their applications for the same to implementing partners.

42% of schools became sustainable role models for nearby schools, villages and homes.

46% wished to have more solar panels installed in their schools

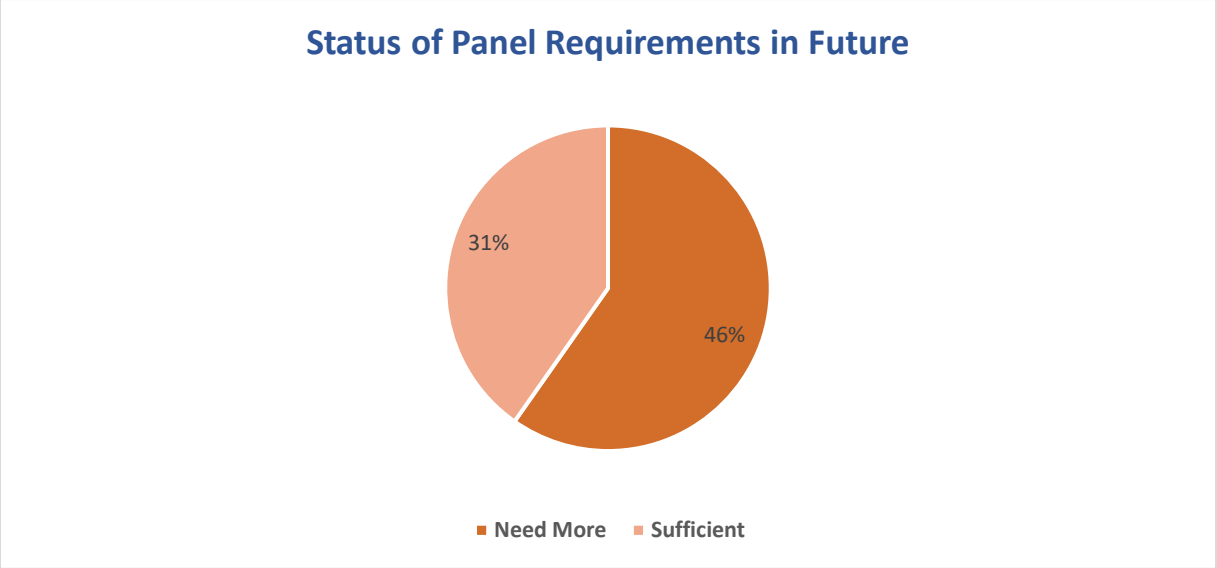
46% of parents of students liked and acknowledged the intervention

81% of schools are channelising savings from electricity bills in school welfare

65% of the schools realised the importance of solar energy in their lives

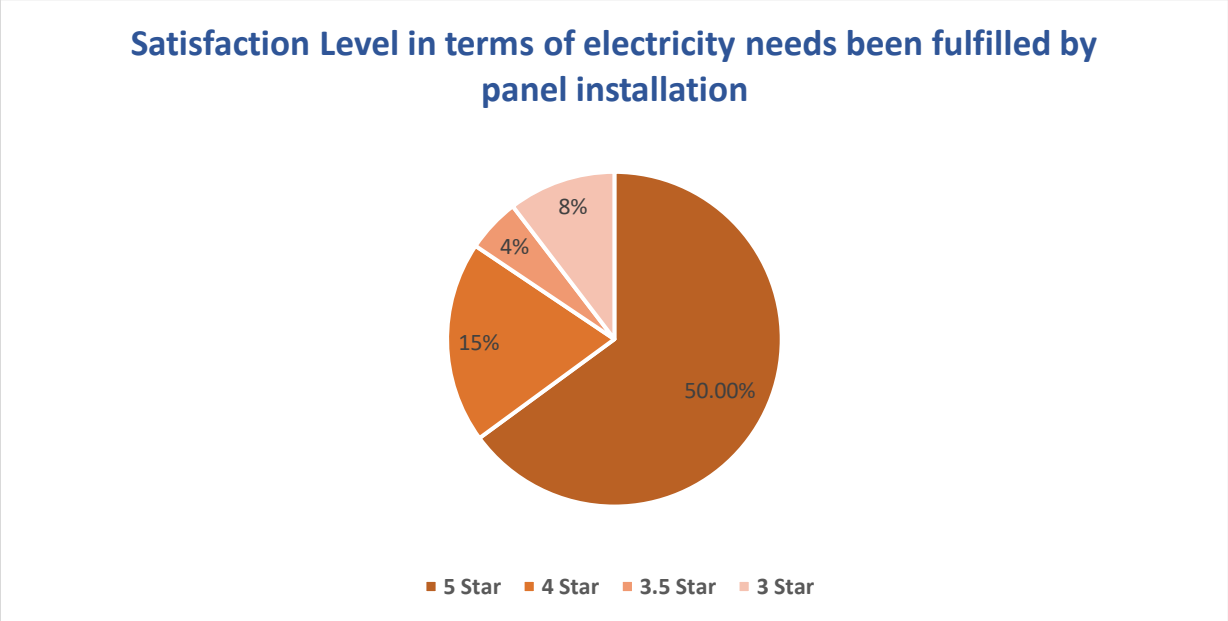
Understanding Panel Importance

46% of schools have realised the need to install more solar panels. Out of this proportion, residential schools wish to have more panels installed mainly because of greater electricity needs during and even after school hours for students. In a few residential schools, panels are supporting hostel buildings only. However, they wish to have the facilities in their school buildings as well to avail better educational facilities.



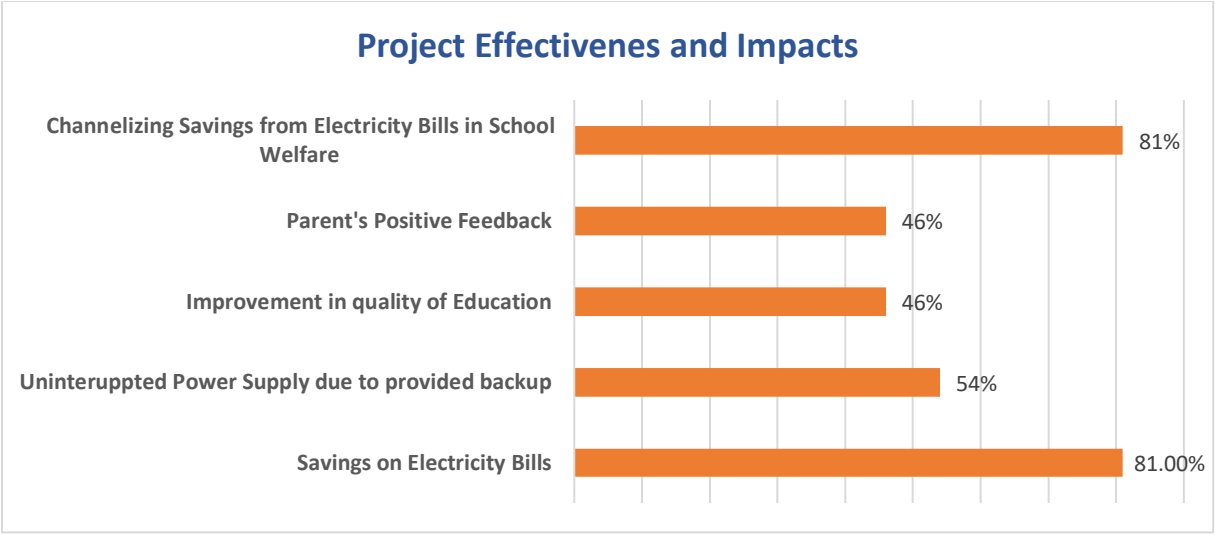
Perception towards intervention

46% of parents in schools are positive towards the intervention and acknowledge the initiative happening in school. They could feel the improvement in quality of education of their children as well as in their performances.



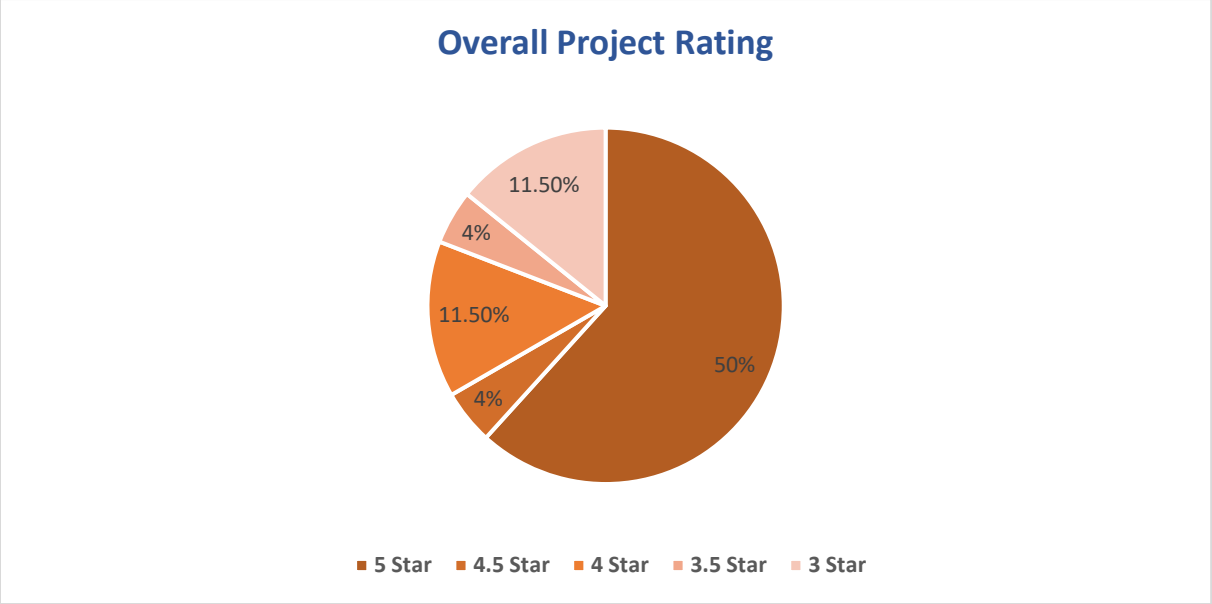
Channelisation of Savings on Electricity Bills

81% of schools are channelising their savings on electricity bills in their respective school's welfare, such as - stationaries, maintenance and repair, student's exam fees, water bills, sponsoring students from tribal areas, digital tools and education



Understanding the importance of solar energy as a resource

65% of the schools realised the importance of solar energy in their lives through this project. Students narrated that solar energy harnesses the power of sunlight, converting it into a sustainable source of energy that not only provides a clean and renewable alternative but also contributes significantly to energy conservation. The widespread adoption of solar energy has yielded numerous benefits, addressed a multitude of challenges and resolved a majority of our pressing issues.



3.1.6 Sustainability

Panel Lifespan

The panels have **27 years of lifespan**. Panels **degrade at the rate of 2.5%** in functionality after 1st year and **0.5 % in subsequent years**. Hence, efficiency goes down from 90% to 80% (in the span of 27 years of warranty). If the percentage of efficiency goes below 80% in 27 years, panels will be replaced free of cost. Recycle company will take panels for recycling at the recycling centre once the panel will expire.

Panel Cleaning

The **cleaning of the panels is carried out sustainably**. Schools typically employ two approaches for cleaning: using water buckets or water pipes. It takes approximately 2-3 buckets to clean a single solar panel, while water pipes, operating at high pressure, are usually used for 2-3 minutes to clean each panel. The total number of panels installed in a single school range from 9 to 12. The methodology for cleaning is simple – pour water on the panel first and then wipe with a cloth. There have been **no instances of water shortages** in past for cleaning purposes. The source of water usually is from submersibles or borewells present in school.

3.2 Brand Perspective

35% of teachers and principals were familiar with the brand name and had heard about it through advertainments, word of mouth and insurance incurred.

35% of teachers and principals were familiar with the brand name

65% schools were aware that the project was undertaken by ICICI Lombard

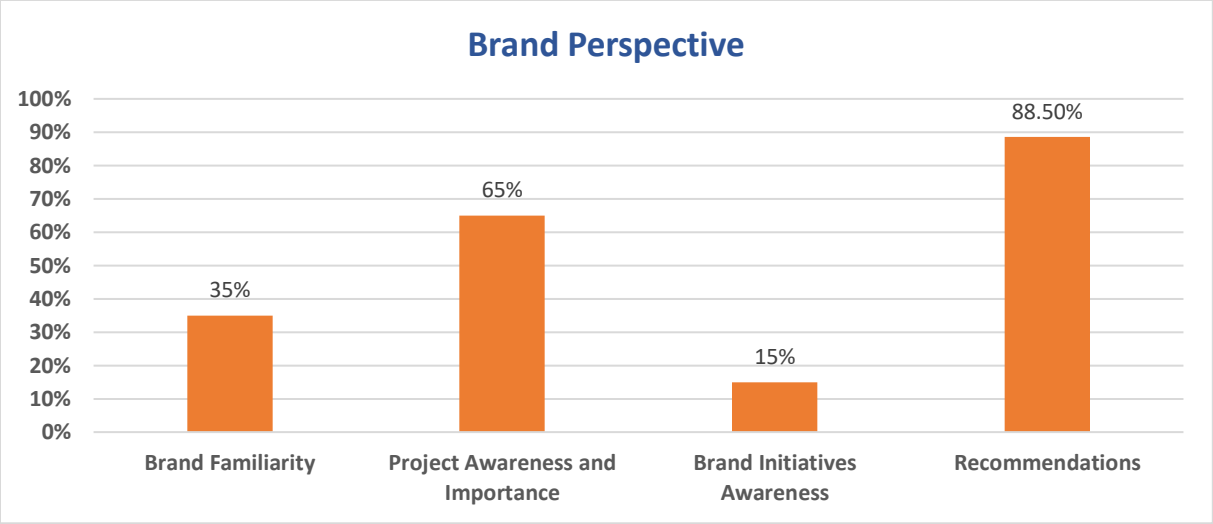
19% schools realised the importance of solar energy in their lives.

15% schools were aware about other initiatives undertaken by ICICI Lombard

11.5% of schools were aware about the helmet programme (Ride to safety).

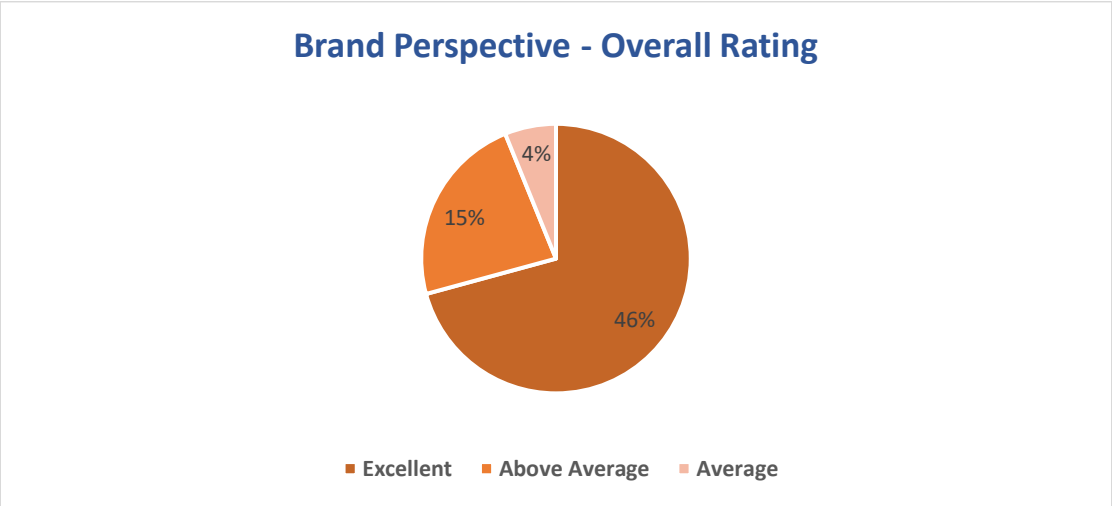
88.5% of Schools would highly recommend this programme in their peers

65% schools were aware that the project was undertaken by ICICI Lombard and 19% schools also realized the importance of solar energy in their lives.



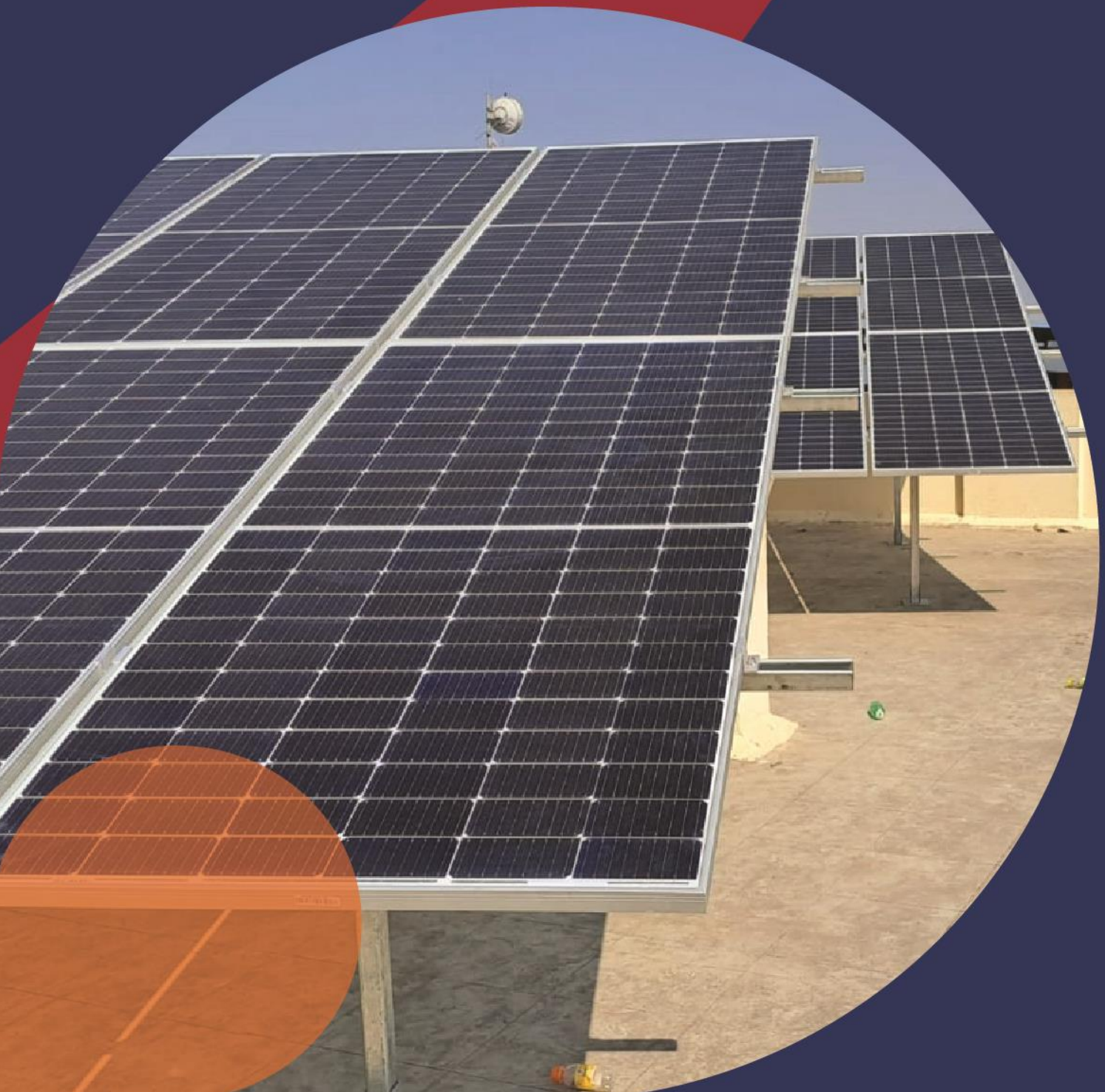
15% schools were aware of other initiatives undertaken by ICICI Lombard. 11.5% of schools were aware of the helmet programme (Ride to Safety). They mentioned that the programme brought a lot of awareness. One school was aware of the Niranjali water programme.

88.5% of schools believed that ICICI Lombard should do such initiatives quite often and also responded that they would very likely recommend their programme to other schools



Chapter 4 :

Social Return on the Investment (SROI) of the Project



Chapter 4: Social Return on the Investment (SROI)

Social Return on Investment (SROI) is both a process and a method used to quantify the social impact of projects, programmes, and policies. It provides funders with insight into the monetary value of the social and environmental benefits generated by the initiative. Going beyond standard financial measures of economic return, SROI captures both social and financial value. Here, the value has been computed based on the actual outcomes of the Solar Panel project. The data has been sourced from the primary survey and secondary references.

INR 1.48 social value generated on investment of INR 1

The SROI value has been computed for 20 years as the solar panels have a lifespan of 20 years post which their efficiency decreases. Given that Social Return on Investment (SROI) accounts for the longevity and duration of benefits resulting from an intervention, the SROI is forward looking and the current valuation is diminished as it only incorporates the effects of two years.

Indicator	Rationale	Proxy Estimation	Source
Savings on School Electricity Bills	Installation of Solar Panels in schools has discounted the electricity expenses of schools by about 83 %	Comparing the average pre and post-monthly electricity expenses of schools (Primary Research Data)	Primary Research
Channelisation of Savings from Electricity bills into School Welfare	The savings generated on electricity bills are being used in school welfare initiatives such as stationery, Maintenance and repair, student exam fees, and uniforms.		Primary Research
Increase in usage of digital tools and equipment for education	The savings on electricity bills are providing confidence to schools to increase or start the digital learning model.		Primary Research
Improvement in Student's learning and performance	Student's understanding and learning of key concepts are improving through visuals and digital education models.		Primary Research
Uninterrupted and smooth learning experience	The backup provided through solar electrification is providing uninterrupted power supply to schools and learning experience. This prevents the interruptions caused in learning before the intervention through power cuts.		Primary Research

Decrease in carbon emissions due to Solar Panel Installations	Installation of Solar Panels in schools have resulted in the reduction in Carbon Emissions generated from schools from atmosphere per month	Social Cost associated with per ton of Carbon Emission Reduction	Primary Research

SROI Calculation

Social Return on Investment			
Year	**FY 2022-2023**	**FY 2023-2024**	**FY 2024-2025**
Inflation Rate in India (IMF, 2023)	6.70%	5.40%	4.40%
Discounted Rate Considered	6%		
Total Input Cost	INR 57,200,000.00		
Total Net Impact	INR 89104261.68		
Net Present Value (NPV)	INR 84,459,015.81		
SROI	**1.48**		

Chapter 5 :

Recommendations and Way Forward

Chapter 5 – Recommendations and Way Forward

1. **Increase in Power Backup Capacity -** It is suggested that the **capacity of backup provided with solar panels should be increased** in order to support more rooms in schools. Currently, the power backups are only supporting some limited schools. In a few schools, the backup isn't active and connected.

- Increase in power backup capacity
- Increase in power backup support
- Time taken for net metering and load sanctioning
- Safe and easy accessibility to panels and water for cleaning
- Standardizing cleaning frequency
- Frequent monitoring physical visits

2. **Increase in Power Backup Support -** It is suggested that **the power backup provided should support multiple main rooms**, such as digital laboratories and classrooms, for an uninterrupted and smooth educational experience. The **backup should be prioritised towards the main educational rooms of the schools.**

3.**Time taken for Net Metering and Load Sanctioning -** The process of net metering of panels and sanctioning of school load is time-consuming due to the delay in approvals from state electricity boards. Because of this reason, even after the installation of panels, the schools are unable to avail benefits such as - savings in electricity bills and uninterrupted supply of electricity to schools. It is suggested that the process should be fastened and smoothened by liasoning with the relevant local authorities. It should be made a key priority area for state electricity boards.

4. **Safe and Easy Accessibility to Panels and Water -** Most of the school's personnel are scared to go to the roof for cleaning because of the risk of slipping. Also, **90 per cent of schools in Maharashtra don't have direct water accessibility** facilities available on school roofs. The combination of these factors complicates the panel cleaning process, leading to a reduction in cleaning frequency over time. Therefore, it is recommended that panels be installed in easily accessible locations. Additionally, there should be provisions for direct access to water on terraces or roofs to facilitate a convenient and efficient cleaning process. It is advisable to conduct cleaning activities before sunrise.

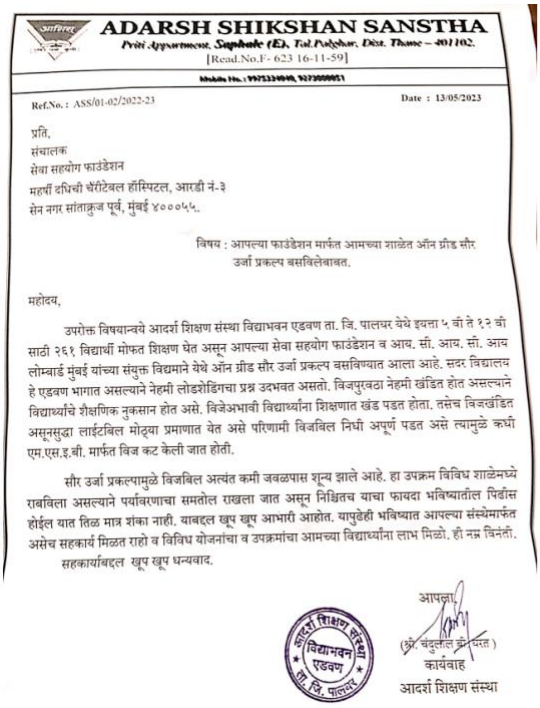
5. **Standardising Cleaning Frequency-** It is suggested that the frequency of **cleaning of panels should be standardised**. Currently, the frequency of cleaning varies from school to school.

6. **Frequent Monitoring Physical Visits -** It is suggested that there should be frequent monitoring physical visits from the technical as well as implementation teams to have an in-depth understanding and close monitoring of the ongoing status of the project. This will help the schools

Impact Stories

Impact Stories

Testimonials



ADARSH SHIKSHAN SANSTHA
Prati Appartment, Saphale (E), Tal.Palghar, Dist. Thane – 401 702.
[Read.No.F- 623 16-11-59]

Ref.No. : ASS/01-02/2022-23 Date : 13/05/2023

प्रति,
संचालक
सेवा सहयोग फाउंडेशन
महर्षी दधिची चॅरीटेबल हॉस्पिटल, आरडी नं-३
सेन नगर सांताक्रुज पूर्व, मुंबई ४०००५५.

विषय : आपल्या फाउंडेशन मार्फत आमच्या शाळेत ऑन ग्रीड सौर ऊर्जा प्रकल्प बसविलेबाबत.

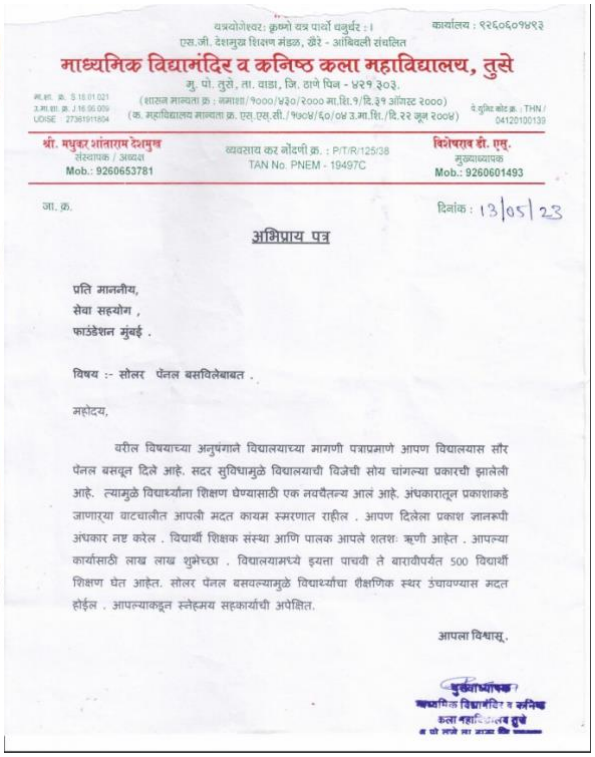
महोदय,

उपरोक्त विषयान्वये आदर्श शिक्षण संस्था विद्याभवन एडवण ता. जि. पालघर येथे इयत्ता ५ वी ते १२ वी साठी २६१ विद्यार्थी मोफत शिक्षण घेत असून आपल्या सेवा सहयोग फाउंडेशन व आय. सी. आय. सी. आय लोम्बार्ड मुंबई यांच्या संयुक्त विद्यमाने येथे ऑन ग्रीड सौर ऊर्जा प्रकल्प बसविण्यात आला आहे. सदर विद्यालय हे एडवण भागात असल्याने नेहमी लोडशेडिंगचा प्रश्न उद्भवत असतो. विजपुरवठा नेहमी खंडित होत असल्याने विद्यार्थ्यांचे शैक्षणिक नुकसान होत असे. विजेअभावी विद्यार्थ्यांना शिक्षणात खंड पडत होता. तसेच विजखंडित असूनसुद्धा लाईटबिल मोठ्या प्रमाणात येत असे परिणामी विजबिल निधी अपूर्ण पडत असे त्यामुळे कधी एम.एस.इ.बी. मार्फत बिज कट केली जात होती.

सौर ऊर्जा प्रकल्पामुळे विजबिल अत्यंत कमी जवळपास शून्य झाले आहे. हा उपक्रम विविध शाळेमध्ये राबविला असल्याने पर्यावरणाचा समतोल राखला जात असून निश्चितच याचा फायदा भविष्यातील पिढीस होईल यात तिळ मात्र शंका नाही. याबद्दल खूप खूप आभारी आहोत. यापुढेही भविष्यात आपल्या संस्थेमार्फत असेच सहकार्य मिळत राहो व विविध योजनांचा व उपक्रमांचा आमच्या विद्यार्थ्यांना लाभ मिळो. ही नम्र विनंती.

सहकार्याबद्दल खूप खूप धन्यवाद.

आपला,
(श्री. चंदुलाल डी. पारेख)
कार्यवाह
आदर्श शिक्षण संस्था



यज्ञयोगेश्वरः कृष्णो यज्ञं पार्थो वत्सुर्धरः ।। कार्यालय : ९२६०६०१५९३
एस.जी. देशमुख शिक्षण मंडळ, खैरे - आंबिवली संचलित

माध्यमिक विद्यामंदिर व कनिष्ठ कला महाविद्यालय, तुसे
मु. पो. तुसे, ता. वाडा, जि. ठाणे पिन - ४२१ ३०३.
(शासन मान्यता क्र : मनाशा/१०००/४३०/२००० मा.शि.१/दि.३१ ऑगस्ट २०००)
(क. महाविद्यालय मान्यता क्र. एस.एस.सी./१७०४/६०/०४ उ.मा.शि./दि.२२ जून २००४)

श्री. मधुकर शांताराम देशमुख
संस्थापक / अध्यक्ष
Mob.: 9260653781

व्यवसाय कर नोंदणी क्र. : PT/R/125/38
TAN No. PNEM - 19497C

विशेषराव डी. एम्.
मुख्याध्यापक
Mob.: 9260601493

जा. क्र. दिनांक : 13/05/23

अभिप्राय पत्र

प्रति माननीय,
सेवा सहयोग ,
फाउंडेशन मुंबई .

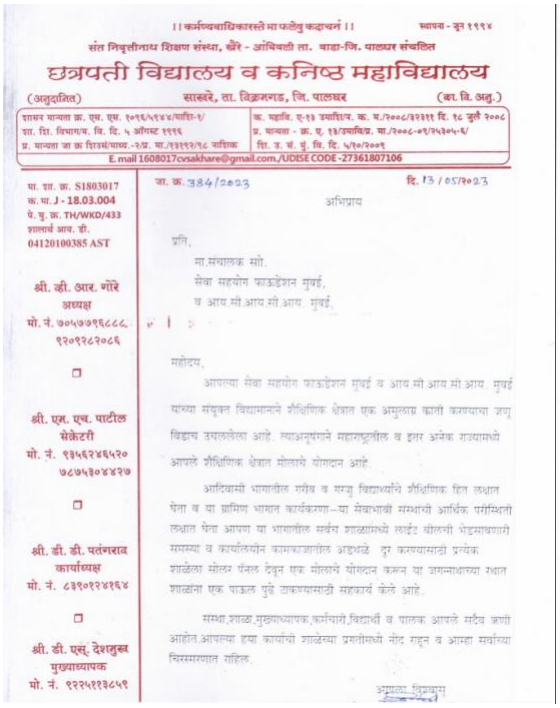
विषय :- सोलर पॅनल बसविलेबाबत .

महोदय,

वरील विषयाच्या अनुषंगाने विद्यालयाच्या मागणी पत्राप्रमाणे आपण विद्यालयास सौर पॅनल बसवून दिले आहे. सदर सुविधामुळे विद्यालयाची विजेची सोय चांगल्या प्रकारची झालेली आहे. त्यामुळे विद्यार्थ्यांना शिक्षण घेण्यासाठी एक नवचैतन्य आलं आहे. अंधकारातून प्रकाशकडे जाणाऱ्या वाटचालीत आपली मदत कायम स्मरणात राहील . आपण दिलेला प्रकाश ज्ञानरूपी अंधकार नष्ट करेल . विद्यार्थी शिक्षक संस्था आणि पालक आपले शतशः ऋणी आहेत . आपल्या कार्यासाठी लाख लाख शुभेच्छा . विद्यालयामध्ये इयत्ता पाचवी ते बारावीपर्यंत 500 विद्यार्थी शिक्षण घेत आहेत. सोलर पॅनल बसल्यामुळे विद्यार्थ्यांचा शैक्षणिक स्थर उंचावण्यास मदत होईल . आपल्याकडून स्नेहमय सहकार्याची अपेक्षित.

आपला विश्वासू,

मुख्याध्यापक
माध्यमिक विद्यामंदिर व कनिष्ठ
कला महाविद्यालय तुसे



।। कर्मण्येवाधिकारस्ते मा फलेषु कदाचनं ।। स्थापना - जून १९९४
संत निवृत्तीनाथ शिक्षण संस्था, खैरे - आंबिवली ता. वाडा-जि. पालघर संचलित

छत्रपती विद्यालय व कनिष्ठ महाविद्यालय
(अनुदानित) साखरे, ता. विक्रमगड, जि. पालघर (का. वि. अनु.)

शाखर मान्यता क्र. एम. एच. १०९६/५१४४/माशि-४/ क. महावि. ए-१३ उमाशिप्र. क्र. म./२००८/३२११ दि. १८ जुलै २००८
शा. शि. विभाग/म. वि. दि. ५ ऑगस्ट १९९६ प्र. मान्यता - क्र. ए. १३/उमाविप्र. मा./२००८-०९/२५३५-६/
प्र. मान्यता जा क्र शिउवे/माध्य.-२/प्र. मा./१३१९२/९८ माशिक शि. उ. सं. पुं. वि. दि. ५/१०/२००९

E.mail 1608017cvsakhare@gmail.com./UDISE CODE -27361807106

प्र. शा. क्र. S1803017
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शालवार्ष आय. डी.
04120100385 AST

श्री. वी. आर. गोरे
अध्यक्ष
मो. नं. ७०५७७९६८८८, ९२०९२८२०८६

श्री. एम. एच. पाटील
सेक्रेटरी
मो. नं. ९३५६२४६५२०, ७८७५३०४४२७

श्री. डी. डी. पतंगराव
कार्याध्यक्ष
मो. नं. ८३९०१२४१६४

श्री. डी. एस्. देशमुख
मुख्याध्यापक
मो. नं. ९२२५११३८५९

जा. क्र. 384/2023 दि. 13/05/2023

अभिप्राय

प्रति,
मा.संचालक सो.
सेवा सहयोग फाऊंडेशन मुंबई,
व आय.सी.आय.सी.आय. मुंबई.

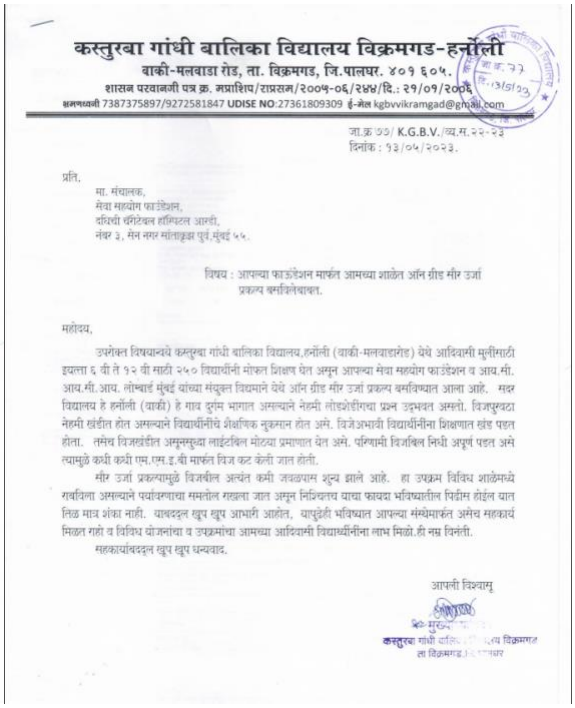
महोदय,

आपल्या सेवा सहयोग फाऊंडेशन मुंबई व आय.सी.आय.सी.आय. मुंबई यांच्या संयुक्त विद्यमानाने शैक्षणिक क्षेत्रात एक अमुलाग्र क्रांती करण्याचा जणू विडाच उचलेलेला आहे त्याअनुषंगाने महाराष्ट्रातील व इतर अनेक राज्यामध्ये आपले शैक्षणिक क्षेत्रात मोलाचे योगदान आहे.

आदिवासी भागातील गरीब व गरजू विद्यार्थ्यांचे शैक्षणिक हित लक्षात घेता व या सामिल भागात कार्यकरणा-या सेवाभावी संस्थांची आर्थिक परिस्थिती लक्षात घेता आपण या भागातील सर्वच शाळांमध्ये लाईट बोलणी भेडसावणारी समस्या व कार्यालयीन कामकाजातील अडथळे दूर करण्यासाठी प्रत्येक शाळेला सोलर पॅनल देवून एक मोलाचे योगदान करून या उणीवांच्या रुपात शाळांना एक पाऊल पुढे टाकण्यासाठी सहकार्य केले आहे.

संस्था,शाळा,मुख्याध्यापक,कर्मचारी,विद्यार्थी व पालक आपले सदैव ऋणी आहोत.आपल्या ह्या कार्याची शालेय्या प्रगतीमध्ये नोंद राहून व आमचा सर्वांच्या चिरस्मरणात राहिल.

आपला विश्वास



कस्तुरबा गांधी बालिका विद्यालय विक्रमगड-हनोली
वाकी-मलवाडा रोड, ता. विक्रमगड, जि.पालघर. ४०१ ६०५.
शासन परवानगी पत्र क्र. मप्राशिप/राप्रसम/२००५-०६/२४४/दि.: २१/०१/२००६
दूरध्वनी 7387375897/9272581847 UDISE NO:27361809309 ई-मेल kgbvvikramgad@gmail.com

जा.क्र ७७/ K.G.B.V./व्य.स.२२-२३
दिनांक : १३/०५/२०२३.

प्रति,
मा. संचालक,
सेवा सहयोग फाउंडेशन,
दधिची चॅरीटेबल हॉस्पिटल आरडी,
नंबर ३, सेन नगर सांताक्रुज पूर्व,मुंबई ५५.

विषय : आपल्या फाऊंडेशन मार्फत आमच्या शाळेत ऑन ग्रीड सौर ऊर्जा प्रकल्प बसविलेबाबत.

महोदय,

उपरोक्त विषयान्वये कस्तुरबा गांधी बालिका विद्यालय,हनोली (वाकी-मलवाडारोड) येथे आदिवासी मुलींसाठी इयत्ता ६ वी ते १२ वी साठी २५० विद्यार्थींनी मोफत शिक्षण घेत असून आपल्या सेवा सहयोग फाउंडेशन व आय.सी. आय.सी.आय. लोम्बार्ड मुंबई यांच्या संयुक्त विद्यमाने येथे ऑन ग्रीड सौर ऊर्जा प्रकल्प बसविण्यात आला आहे. सदर विद्यालय हे हनोली (वाकी) हे गाव दुर्गम भागात असल्याने नेहमी लोडशेडींगचा प्रश्न उद्भवत असतो. विजपुरवठा नेहमी खंडीत होत असल्याने विद्यार्थींचे शैक्षणिक नुकसान होत असे. विजेअभावी विद्यार्थींनींना शिक्षणात खंड पडत होता. तसेच विजखंडीत असूनसुद्धा लाईटबिल मोठ्या प्रमाणात येत असे. परिणामी विजबिल निधी अपूर्ण पडत असे त्यामुळे कधी कधी एम.एस.इ.बी मार्फत बिज कट केली जात होती.

सौर ऊर्जा प्रकल्पामुळे विजबील अत्यंत कमी जवळपास शून्य झाले आहे. हा उपक्रम विविध शाळेमध्ये राबविला असल्याने पर्यावरणाचा समतोल राखला जात असून निश्चितच याचा फायदा भविष्यातील पिढीस होईल यात तिळ मात्र शंका नाही. याबद्दल खूप खूप आभारी आहोत, यापुढेही भविष्यात आपल्या संस्थेमार्फत असेच सहकार्य मिळत राहो व विविध योजनांचा व उपक्रमांचा आमच्या आदिवासी विद्यार्थींनींना लाभ मिळो.ही नम्र विनंती.

सहकार्याबद्दल खूप खूप धन्यवाद.

आपली विश्वासू

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[illegible]

कै. श्री. तु. ल. पाटील अनुदानित माध्यमिक आश्रम शाळा पडघे ता. जि. पालघर

[illegible]

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दिनांक : 13/05/2023

प्रति ,

मा. अध्यक्ष,

सेवा सहयोग फाउंडेशन मुंबई ,

विषय : सोलार पॅनेल बसविल्यामुळे शाळेत झालेल्या फायदया बाबत. .

महोदय ,

ग्रामीण शिक्षण संस्था उमरोळी संचलित, कै. श्री. तु. ल. पाटील अनुदानित माध्यमिक आश्रम शाळा पडघे, ता, जि. पालघर या शाळेत आपल्या सेवा सहयोग फाउंडेशन तसेच आयसीआयसीआय लोंबार्ड मार्फत सोलार पॅनेल बसवून दिलेले आहेत. सदर सोलार पॅनेल बसविल्यामुळे विजेची बचत मोठया प्रमाणात होत आहे. संस्थेवर होणारा आर्थिक भार देखील कमी झालेला आहे. पर्यावरणाच्या दृष्टीने देखील सोलार पॅनेल फारच फायदेशिर आहेत. शाळा दुर्गम भागात असल्याने विज पुरवठा वारंवार खंडीत होत असतो म्हणून दुर्गम भागामध्ये सोलार पॅनेल अतिशय उपयुक्त ठरत आहेत.

आपण केलेल्या सहकार्या बाबत आपले आभार व धन्यवाद !

कळावे ,

आपला विश्वासू ,

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ता. जि. पालघर

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nutanvidyamandir.umroli@gmail.com

जा. क्र. 12 /२०23-२०24

दिनांक 13/5/2023

प्रति,

सेवा सहयोग फाऊंडेशन मुंबई यांसी.

महाशय,

आमच्या नूतन विद्यामंदिर, उमरोळी या शाळेत 340 विद्यार्थी गावातून व पंचक्रोशीतून इ. 5 वी इ. 10वी पर्यंत शिक्षण घेत आहेत. आमची शाळा गावाच्या परिसरात असल्याने सतत विद्युत पुरवठा खंडीत होतो. त्यामुळे विद्यार्थ्यांना शिक्षण घेणे अवघड जात आहे.

तसेच मासिक लाईट बील 4 ते 5 हजार पर्यंत येत आहे. ही बाब लक्षात घेऊन आपण आपल्या सेवाभावी संस्थेमार्फत आम्हास सोलर पॅनल उपलब्ध करून दिल्याने दिवसभर विद्युत पुरवठा सुरळीत असून लाईटबील (एप्रिल 2023) ₹ 190 पर्यंत आले आहे. त्याबद्दल आपले आभार!

असेच यापुढे सहकार्य असू द्यावे. ही नम्र विनंती!

आपला विश्वासू,

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