Impact Assessment Report

Solar Power Plants in Government Hospitals

FY 2024 - 25

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Acknowledgements

SGS would like to place on record its sincere appreciation to Aavas Financiers Ltd for the opportunity to undertake this impact assessment of the solar power installation project in government hospitals. We are grateful for the trust placed in us and for the guidance and support extended during the course of the study. The organization's commitment to promoting clean energy and supporting public institutions through its CSR initiatives provided a strong foundation for this assessment.

We extend our heartfelt thanks to Aavas Foundation, the implementing agency, for its cooperation and support throughout the assessment process. Their inputs on project planning, site selection, implementation progress, and overall coordination helped the assessment team develop a clear understanding of the intervention and its intended outcomes across the selected hospital sites.

We would also like to thank the hospital administration, hospital staff, and concerned authorities at the project locations for their valuable time and cooperation during field visits. Their support in facilitating interactions, sharing institutional perspectives, and explaining the relevance and use of the solar installations helped enrich the assessment with grounded field-level insights.

We are equally thankful to the vendor representatives associated with the installation and maintenance of the solar systems for sharing technical and operational information. Their inputs on installation, system functioning, maintenance arrangements, and implementation challenges contributed meaningfully to the study.

Finally, we would like to acknowledge all stakeholders who participated in the assessment and shared their perspectives with openness and sincerity. Their contributions were important in helping us assess the project's relevance, usefulness, and sustainability.

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Executive Summary

India is one of the world's fastest-growing energy consumers, making the transition to cleaner and more sustainable power increasingly important. Under its updated Nationally Determined Contribution, India has committed to achieving about 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030. Solar energy has emerged as a major part of this transition, and official data from the Ministry of New and Renewable Energy show that India's cumulative solar power capacity had reached 143.60 GW as of 28 February 2025.

This shift is especially relevant for public healthcare institutions, where reliable electricity is essential for lighting, equipment, diagnostics, ventilation, and day-to-day service delivery. National guidelines for healthcare facilities note that solarization can support the energy transition of healthcare institutions from fossil-fuel dependence to renewable sources. In this context, solar installations in government hospitals carry a dual value: they support cleaner energy adoption and can also help reduce the recurring electricity burden on public institutions.

In this broader context, Aavas Financiers Ltd, through Aavas Foundation, supported the installation of on-grid solar power systems in selected government hospitals. The intervention was designed to promote green energy adoption, reduce dependence on conventional electricity, and lower the electricity burden on public healthcare institutions. The project covered six government hospitals across five states with a total supported capacity of 620 kWp. Project sites included Sassoon General Hospital, Pune; Taluka General Hospital, Gokak; Civil Hospital, Sola Ahmedabad; Government Cancer Hospital, Indore; Shri Kalyan Dharamshala of Sawai Man Singh Hospital, Jaipur; and Government Dental College and Hospital, Jamnagar.

The present impact assessment was undertaken by SGS to examine the relevance, effectiveness, efficiency, impact, and sustainability of the intervention. The assessment adopted a mixed-methods approach combining review of project records, field visits, stakeholder surveys, key informant interviews, and site observations. Field assessment was conducted across four visited hospitals and the analysis was guided by the OECD-DAC evaluation framework

Key insights:

The assessment highlights that the project was highly relevant for public hospitals with high electricity demand, large campuses, and regular dependence on equipment-heavy services. Baseline findings showed wide variation in monthly electricity expenditure across the assessed hospitals, ranging from about ₹60,000 in smaller facilities to nearly ₹60,00,000 in a large institutional campus like Ahmedabad. This indicates that renewable energy adoption was particularly meaningful in these settings, not only from an environmental perspective but also as a practical measure for long-term operational efficiency and reduction of recurring electricity burden.

The programme demonstrates strong effectiveness across most assessed locations. Hospitals in Ahmedabad, Jamnagar, and Jaipur reported visible reduction in electricity expenditure after installation, and the systems in these locations were generally functioning well, manageable in routine use, and largely free from major recent breakdowns. The main exception was Indore, where an inverter fault remained unreported for some time due to limited site-level awareness, routine cleaning was not carried out, and electricity bills were misinterpreted because of an unrelated contracted-load upgrade. These issues point to the need for stronger internal awareness and clearer maintenance responsibility at hospital level.

From an efficiency perspective, project execution was found to be largely smooth and well managed. Vendor coordination during installation was rated positively in most hospitals, timelines were broadly adhered to with only minor delays, and workmanship quality was viewed favorably. Qualitative inputs also suggest that vendor teams accommodated site-level requirements in hospitals such as Jamnagar and Ahmedabad so that routine operations were not disturbed. Observation findings further showed that key technical and safety elements, including cabling, mounting, earthing, and installation quality, were largely in place across the assessed sites.

From an impact and sustainability perspective, the project has started generating both immediate and long-term value.

India's Updated First Nationally Determined Contribution submitted to UNFCCC, 2022; Ministry of New and Renewable Energy, Physical Progress; National Centre for Disease Control, Guidelines for Solar Powering Healthcare Facilities; National Centre for Disease Control, Guidelines for Green and Climate Resilient Healthcare Facilities; project documents and assessment findings

The installations have contributed to reduced electricity expenditure, partial improvement in power reliability for essential services, and creation of renewable energy infrastructure within public hospitals. At the same time, while the project includes a two-year O&M support arrangement, awareness of this was uneven across hospitals, and internal maintenance capacity remains limited in most locations. Preventive cleaning, documentation, and staff orientation were also not equally strong at all sites. Even so, the project has created a durable foundation for green energy adoption and for cleaner, climate-aligned institutional operations over the long term.

Way Forward

The project has created a strong foundation for integrating clean energy infrastructure into public hospitals. Going forward, greater focus is needed on post-installation ownership, with clearer communication on O&M roles, AMC duration, fault-reporting procedures, and support contacts.

Routine system care also needs to be more structured. Simple maintenance schedules, regular panel cleaning, visible contact details, and basic staff orientation can help reduce avoidable performance gaps. With stronger follow-up at hospital level, the intervention can continue delivering financial savings, support greener operations, and serve as a useful model for similar public-sector initiatives.

Hospitals Supported Under the Project

6

government hospitals were supported across five states under the solar installation initiative.

On-grid Solar Capacity Installed

620 KWp

A total of 620 kWp of on-grid solar capacity was installed across the selected hospital sites.

Reduced electricity expenditure

75%

75% of respondents reported reduced monthly electricity expenditure after solar installation.

Support to critical services

75%

of respondents reported partial or full improvement in power reliability

SDGs Alignment

SDG	Target	Contribution Pathway
	7.2 – Increase the share of renewable energy in the global energy mix 7.3 – Double the global rate of improvement in energy efficiency	The project supports clean energy adoption in government hospitals through installation of on-grid solar systems. It also helps reduce dependence on conventional electricity and lowers institutional energy costs.
	13.2 – Integrate climate change measures into policies, strategies and planning	By introducing solar energy in public hospitals, the project promotes environmentally sustainable infrastructure and supports climate-conscious institutional practices.
	3.8 – Achieve access to quality essential healthcare services	The project indirectly supports healthcare delivery by reducing electricity burden and improving power availability for smooth functioning of hospital services.

https://sdgs.un.org/goals

Introduction

INDIA'S ENERGY AND CLIMATE CONTEXT

India is one of the world's fastest-growing energy consumers, and this growth has increased the urgency of shifting toward cleaner sources of power. The country has committed, through its updated Nationally Determined Contribution, to achieve about 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030. In this transition, solar energy has emerged as one of the key pillars of India's renewable energy pathway. Over the last decade, solar capacity has expanded sharply from a very low base in the early 2010s to more than 143 GW of cumulative installed solar capacity by February 2026, reflecting the scale of national progress in renewable energy adoption.

Despite this progress, solar adoption within public institutions remains uneven. Government facilities such as hospitals continue to depend largely on conventional electricity for daily operations. This creates an important gap between India's wider clean-energy ambitions and the on-ground energy profile of public service institutions, where the need for reliable and affordable power is constant.

THE BURDEN OF ELECTRICITY COSTS ON PUBLIC HOSPITALS

Government hospitals in India serve large numbers of patients every year, many of whom come from economically vulnerable backgrounds and depend on subsidised or free services.

hese institutions require uninterrupted electricity for lighting, ventilation, diagnostic services, refrigeration, inpatient care, and critical medical equipment. In such settings, electricity is not merely a utility requirement; it directly affects the continuity and quality of service delivery

This importance is also reflected in national evidence. The National Hospital Energy Consumption Survey, conducted under the Ministry of Health and Family Welfare, covered 623 hospitals across India, including public and private facilities, to build a baseline understanding of hospital energy use. The study underlined the need to identify opportunities for energy efficiency and renewable energy interventions in hospitals and highlighted the importance of cleaner and more resilient energy planning in healthcare infrastructure

In this context, rooftop and on-grid solar systems offer a practical institutional solution. They can help reduce dependence on conventional electricity, lower recurring energy expenditure over time, and support cleaner operations within hospital campuses. For public hospitals working within budget constraints, savings in electricity costs can strengthen resource utilisation while also contributing to broader environmental goals.

THE ROLE OF CSR IN BRIDGING THE GAP

Against this backdrop, CSR-supported infrastructure can play an important

India has committed to achieve about 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030. While solar capacity has expanded rapidly, renewable energy adoption in public institutions such as government hospitals still has significant room to grow, even as reliable electricity remains essential for continuous healthcare delivery

enabling role in helping public institutions adopt solutions that address both service-delivery and sustainability needs.

PROJECT GEOGRAPHY AND CONTEXT

It is in this broader context that the present project assumes significance. Supported under the CSR initiative of Aavas Financiers Ltd, with Aavas Foundation as the implementing agency, the intervention focused on installation of on-grid solar systems across six government hospital sites located in five states. The project was designed to promote green energy adoption in public healthcare institutions and to reduce electricity costs, thereby supporting more efficient institutional functioning.

Ministry of New and Renewable Energy (MNRE), Annual Report 2023–24 | Central Electricity Authority (CEA), National Electricity Plan 2023 | India's Updated NDC submitted to UNFCCC, 2022 | Ministry of Health and Family Welfare, National Health Accounts 2021–22 | NITI Aayog, India Energy Security Scenarios 2047

About the Project

Phase wise implementation

Phase 1

Need assessment and site evaluations were conducted with hospital administrations to review roof conditions, structural capacity, and energy requirements for solar installation.

Phase 2

Technical drawings were prepared, BOQs were finalised, and vendor selection was completed, followed by submission of net-metering applications to respective DISCOM authorities.

Phase 3

Solar modules, inverters, and mounting structures were delivered to each site, and installation work was carried out under technical supervision.

Phase 4

Systems were tested and commissioned, grid synchronisation was completed, and hospitals formal handover documentation.

The project assessed under this study focused on the installation of on-grid solar power systems in government hospitals located across different states. Supported under the CSR initiative of Aavas Financiers Ltd and implemented through Aavas Foundation, the intervention was designed to promote clean energy adoption in public institutions while also helping hospitals reduce recurring electricity costs. The project is aligned with the broader thematic area of environment sustainability, affordable and clean energy, and climate action.

The intervention covered six hospital sites across five states—Gujarat, Maharashtra, Karnataka, Madhya Pradesh, and Rajasthan. These included a mix of public healthcare institutions with varying service profiles and infrastructure contexts.

Across all six sites, the combined approved solar capacity was 620 kWp, making the project a meaningful clean-energy intervention within the public healthcare space.

The project responded to a practical institutional need within government hospitals, where electricity is essential for lighting, ventilation, equipment, diagnostics, and several day-to-day service functions. At the hospital level, the rationale for solar installation was closely linked to reducing recurring electricity costs and strengthening reliable power availability for routine operations and critical care functions. The assessment framework and stakeholder tools also show that the project was expected to contribute to reduced electricity expenditure, better institutional efficiency, and longer-term sustainability through operations and maintenance support.

Overall, the project brings together two closely linked objectives. On one hand, it supports India's wider transition toward renewable energy and climate-conscious infrastructure. On the other, it seeks to strengthen public hospitals by easing energy-related costs and supporting more efficient institutional functioning. In this way, the intervention sits at the intersection of environmental sustainability and public service improvement.

About the Project

Project Sites and Installed Capacity			
Sr. No.	**Hospital Name & Location**	**State**	**Installed Capacity (kWp)**
1	Rajkiya Dharmashala SMS Hospital, Jaipur	Rajasthan	70 kWp
2	Sassoon General Hospital, Pune	Maharashtra	150 kWp
3	Sola Civil Hospital, Ahmedabad	Gujarat	100 kWp
4	General Hospital, Gokak	Karnataka	100 kWp
5	Cancer Hospital, Indore	Madhya Pradesh	100 kWp
6	Govt. Dental College & Hospital, Jamnagar	Gujarat	100 kWp

About the Organizations

Aavas Financiers Limited

Aavas Financiers Limited is a publicly listed housing finance institution headquartered in Jaipur, India. Incorporated in 2011, the company received its registration as a Housing Finance Company from the National Housing Bank in August 2011 and formally began operations in March 2012. Over the years, Aavas has built a strong presence across multiple Indian states, focusing on extending housing finance to low- and middle-income households in semi-urban and rural regions—segments often excluded due to informal income sources and limited documentation. Its operations now span hundreds of branches, supported by specialised appraisal methodologies tailored for financially underserved customers.

As a publicly traded entity listed on the Bombay Stock Exchange and National Stock Exchange since 2018, Aavas maintains a strong corporate governance framework, including a dedicated CSR & ESG Committee. The organisation's CSR policy outlines commitments in thematic areas such as education, healthcare, rural development, women's empowerment, and environmental sustainability. These commitments are disclosed transparently through its CSR policy pages and annual reports, reflecting the company's structured approach to responsible business and community development

Aavas Foundation

Aavas Foundation is the not-for-profit organisation established to implement the corporate social responsibility initiatives of Aavas Financiers Limited. Registered under the Rajasthan Public Trusts Act, the Foundation operates with a focus on improving the socio-economic well-being of underserved and marginalised communities across several states. Guided by the principles "Engage, Enable, Enrich," the Foundation's work spans multiple sectors, including education, healthcare and wellbeing, livelihoods and women's empowerment, environmental sustainability, and sports promotion.

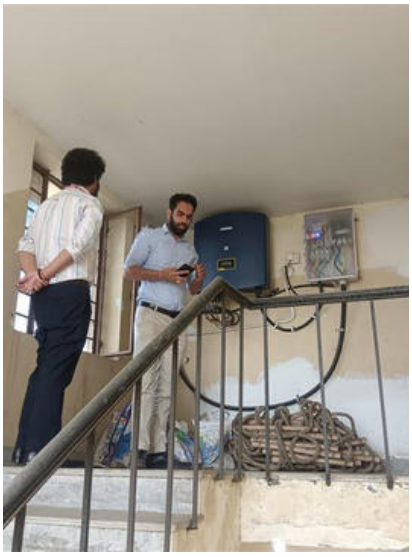
The Foundation implements its programmes through structured verticals - Aavas Gurukul, Aavas Aarogya, Aavas Aajivika, Aavas Green, and Aavas Khelodaya - each aligned with specific Sustainable Development Goals and designed to create long-term, community-centric impact. These initiatives address key development challenges such as access to quality education, improved health outcomes, livelihood enhancement, environmental conservation, and inclusive community engagement. By anchoring its projects within national development priorities and global SDG frameworks, the Foundation demonstrates a strong commitment to sustainable and measurable social progress

APPROACH & METHODOLOGY

Approach & Methodology

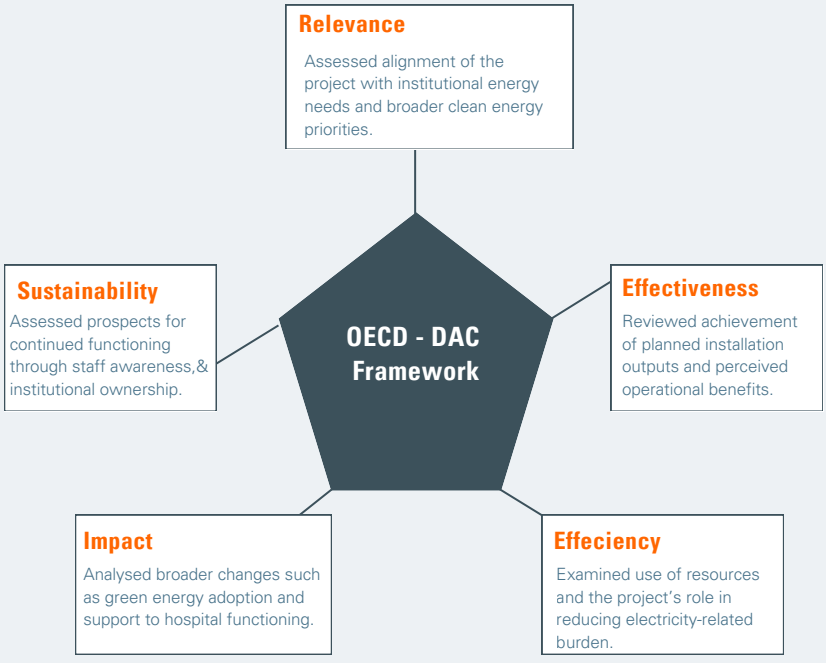
The impact assessment was undertaken using a mixed-method approach, combining qualitative review and field-based validation to build a rounded understanding of the project's relevance, implementation, and emerging outcomes. As the intervention relates to installation of solar systems in government hospitals, the assessment focused not only on project execution, but also on how the systems were perceived and utilised within the institutional setting. Emphasis was placed on triangulating information from multiple sources so that the findings remained balanced, practical, and evidence-based.

A detailed secondary data and document review formed an integral part of the assessment. Key project documents, including the, work orders, approval documents, request letters, and assessment tools, were reviewed to understand the project's rationale, scope, site coverage, implementation arrangements, and intended outcomes. This was complemented by field-based assessment through stakeholder interactions and site observations to build a clear understanding of installation quality, operational arrangements, and post-installation experience across selected hospitals. The review also helped situate the project within the broader context of clean energy adoption in public healthcare institutions.



SGS Team member at project location

OECD DAC Dimensions



OECD–DAC Framework

The impact assessment was guided by the OECD-DAC evaluation framework to ensure a structured and widely accepted approach to assessing project performance and outcomes. This framework provided a clear lens to examine the relevance, effectiveness, efficiency, impact, and sustainability of the solar power installation initiative. By using these dimensions, the assessment was able to systematically review both the design and implementation of the intervention, as well as its contribution towards promoting green energy adoption and supporting government hospitals through reduced electricity burden and improved institutional efficiency.

Theory of Change

Inputs

- CSR funding support from Aavas Financiers Ltd
- Project implementation by Aavas Foundation
- On-grid solar systems and related infrastructure
- Technical and vendor support for installation and commissioning

Activities

- Identification of suitable government hospital sites
- Technical assessment of rooftop space and energy needs
- Installation and commissioning of on-grid solar systems
- Coordination with hospital authorities for handover and initial support

Outputs

- Solar systems installed across selected government hospitals
- 620 kWp total solar capacity supported across six sites
- Clean energy infrastructure integrated into hospital premises
- Basic systems in place for operation and maintenance support

Outcomes

- Reduced electricity burden on supported hospitals
- Increased use of renewable energy in public healthcare institutions
- Better support for routine hospital operations
- Improved institutional efficiency through lower recurring power costs

Impact

- Contribution to clean energy adoption in the public sector
- Support to more sustainable healthcare infrastructure
- Reduced operational pressure on government hospitals

The Theory of Change for this intervention outlines how CSR investment in on-grid solar systems, combined with technical installation and institutional coordination, can help government hospitals adopt cleaner energy solutions. By reducing dependence on conventional electricity and easing recurring power costs, the project contributes to more sustainable infrastructure and better institutional efficiency in public healthcare settings.

Assessment - Deep Dive

TABLE 2 Stakeholder Coverage and Methods Used

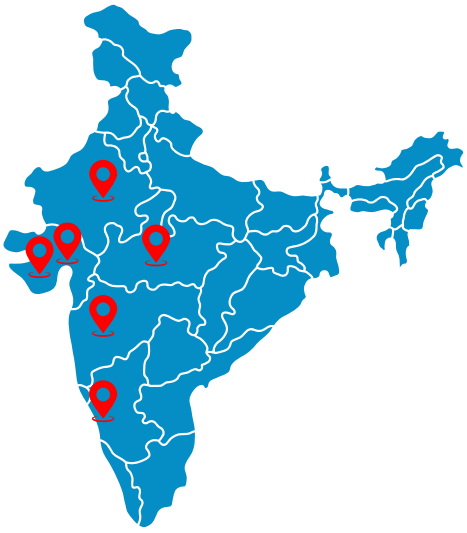
STAKEHOLDER GROUP	PURPOSE OF ENGAGEMENTEL	METHOD USED	SAMPLE / COVERAGE
Hospital Administration	Understand institutional experience, utility of the solar system, and perceived changes in electricity burden	Surveys	4
Hospital Staff & Administration	Gather operational insights on system usage, maintenance, coordination, and institutional relevance	Key Informant Interviews	8
Aavas Foundation Representatives	Understand project rationale, implementation approach, and oversight perspective	Key Informant Interviews	2
Vendor Representative	Capture technical and maintenance perspective on installation and post-installation support	Key Informant Interviews	1

To develop a deeper understanding of how the project functioned on the ground, SGS adopted a focused field-based assessment approach combining institutional feedback, stakeholder insights, and on-site verification. This helped build a practical understanding of how the solar installations were being experienced at the hospital level.

The assessment captured perspectives related to system utility, operational experience, maintenance arrangements, and the perceived value of the installations in supporting hospital functioning. This provided insights beyond project documents and helped assess the intervention in actual operating conditions.

The fieldwork placed emphasis on interactions with hospital administration and staff, along with discussions with Aavas Foundation representatives and the vendor. This enabled validation of installation and maintenance processes, stakeholder experience, implementation quality, institutional ownership.

Stakeholders for the assessment were selected from project hospital sites where the solar systems had been installed under the programme. Inputs were gathered through interactions with hospital administration and staff, along with discussions with Aavas Foundation and vendor representatives.



Assessment Findings & Analysis

This section presents the key findings of the impact assessment based on stakeholder surveys, key informant interviews, field observations, and review of project-related documents. It brings together evidence on how the solar installations are functioning at the hospital level, how they are perceived by institutional stakeholders, and what early changes are visible in terms of operational usefulness, maintenance experience, and overall institutional value.

For the field assessment, site visits were conducted at four supported hospitals: GMERS Medical College & Hospital, Sola, Ahmedabad; Government Dental College & Hospital, Jamnagar; Government Cancer Hospital, Holkar Campus, Indore; and Shri Kalyan Dharamshala, Sawai Man Singh Hospital, Jaipur. Across these sites, 4 structured surveys were conducted with hospital administration representatives. The survey respondents included the Dean, Deputy Engineer, Manager, and Store Keeper, representing different institutional roles connected with administration, technical oversight, and facility operations.

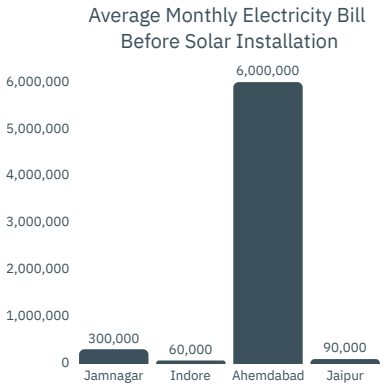
SGS team member with Dean of Indore cancer hospital

In addition, 8 key informant interviews were conducted with hospital staff and administration to capture more detailed institutional perspectives on system functioning, usage, and maintenance experience. The assessment also included interactions with 2 representatives from Aavas Foundation and 1 vendor representative to understand the project from implementation, coordination, and technical support perspectives.

The findings in the following pages are presented across the OECD-DAC dimensions of relevance, effectiveness, efficiency, impact, and sustainability, so as to assess the project not only in terms of installation completion, but also in terms of institutional usefulness, operational experience, and prospects for long-term continuity.

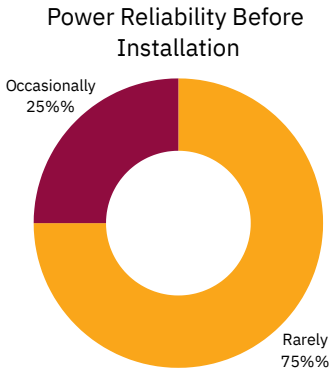
Relevance

The findings indicate that the solar installation project was relevant to the needs of the assessed hospitals, particularly in relation to recurring electricity expenditure and the broader need to adopt cleaner energy solutions in public healthcare institutions. Evidence from surveys, stakeholder interactions, and project documents suggests that the intervention addressed an existing institutional concern and was aligned with the objective of reducing electricity burden while promoting green energy in government hospitals.



The baseline survey findings show that the assessed hospitals were incurring notable monthly electricity expenditure even before solar installation. Reported average monthly electricity bills ranged from ₹60,000 in Government Cancer Hospital, Indore to ₹90,000 in Shri Kalyan Dharamshala, Jaipur, ₹3,00,000 in Government Dental College & Hospital, Jamnagar, and as high as ₹60,00,000 in GMERS Medical College & Hospital, Sola, Ahmedabad. This variation reflects differences in scale and energy consumption across hospitals, but also indicates that electricity formed an important recurring operational cost across all visited institutions.

At the same time, power reliability issues were not reported as a major routine concern in most of the assessed hospitals.



Survey responses show that such issues were faced rarely by three out of four respondents, while one respondent reported facing them occasionally. This suggests that the project's relevance was not driven only by power shortage, but more strongly by the need to reduce electricity costs, improve institutional efficiency, and support sustainable energy use within hospital premises.

Project documents and stakeholder inputs further reinforce this relevance. The request raised by the Ahmedabad hospital had specifically pointed to the need for reducing electricity expenses, promoting renewable energy use, and supporting reliable power availability for hospital operations. Similarly, interactions at the assessed sites suggested that even where grid supply was relatively stable, hospitals still viewed solar power as a useful measure for easing financial burden and improving long-term institutional efficiency.

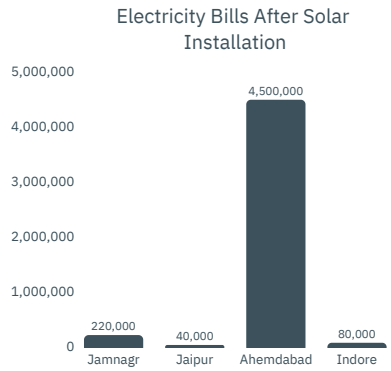
> "Solar installation was useful for the hospital because electricity expenses were high, and the system was expected to reduce that burden while supporting regular operations."

Hospital stakeholder perspective

Effectiveness

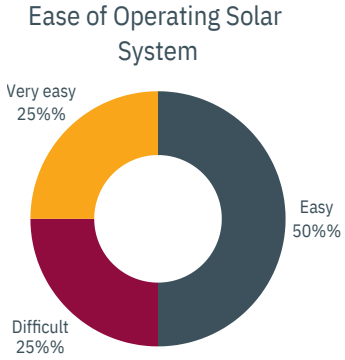
The effectiveness of the solar installation project was assessed across four hospitals through administration surveys, staff interviews, and site observations.

The findings show that the systems are functioning well in three of the four locations, with visible reductions in electricity bills and generally smooth day-to-day use. The intervention is seen as a useful addition to hospital infrastructure, with stakeholders acknowledging easier energy management and lower dependence on conventional power sources. The only exception was the Indore site, where an inverter fault and limited awareness on monitoring and maintenance affected the team's understanding of system performance.

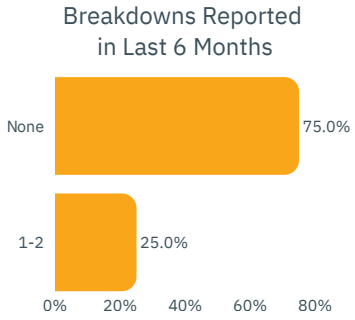


Post-installation bills show a meaningful decrease in most hospitals. Jamnagar reported a fall from about ₹3,00,000 to ₹2,20,000 per month, while Jaipur noted a decline to around ₹40,000.
Ahmedabad showed a major reduction within its higher consumption profile, with bills coming down from nearly ₹60,00,000 to ₹45,00,000. Ahmedabad is a large government hospital campus with an attached medical college, and stakeholders also noted the presence of another 200 kW solar installation within the premises, indicating a broader institutional shift towards solar energy use. These trends suggest that the solar systems have been effective in reducing grid-based consumption and easing the recurring electricity burden on hospital institutions.

Indore remains an exception, where the reported bill increased to around ₹80,000. KIIs suggested that this was not only a billing or perception issue, but also linked to the non-functioning of the system due to an inverter fault, as reported by the vendor during the KII. After SGS shared the plant-status concern with Aavas, the vendor visited the site and confirmed that the inverter had developed a fault, which had affected system performance. The vendor also informed that the earlier increase in contracted load from 45 kW to 100 kW was being recovered by the electricity board in installments through the bills. Dust accumulation and limited routine cleaning further affected performance. This points to the need for stronger internal awareness and follow-up at the site.



Survey responses suggest that the systems were generally easy to manage. 50% of respondents rated the system as easy to operate, 25% as very easy, and 25% as difficult. This indicates that in most hospitals, day-to-day handling of the system did not pose major challenges.
The difficult response appears to be linked to the Indore site, where staff were unsure about system generation and routine reporting procedures. This suggests that ease of operation was better where staff had clearer orientation and familiarity with the system.



System reliability was found to be satisfactory in most of the assessed hospitals. 75% of respondents reported no breakdowns in the last six months, while 25% reported 1 issue. This suggests that the systems have largely been functioning without major disruption across the visited sites.
The reported issue corresponds to Indore, where the inverter fault affected system performance. The other hospitals did not report any major breakdowns or maintenance issues and therefore did not need to contact the vendor during routine operations. In Indore, the hospital had initially tried contacting the MP Electricity Board rather than the vendor.

As a result, stakeholder perception regarding the vendor's post-installation service and behaviour cannot be meaningfully analysed at this stage, since most hospitals had no occasion to seek such support after installation.

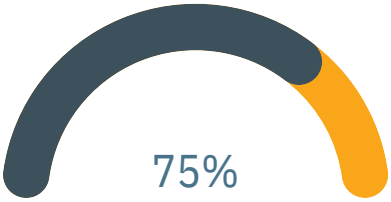
> "The system is currently meeting approximately 80% of the Jaipur's Site (Dharamshala) total energy demand, thereby reducing dependence on grid electricity and contributing to substantial cost savings"

Jaipur Hospital represntative

Overall, the solar systems have shown strong effectiveness in improving cost efficiency and supporting smoother day-to-day operations across three of the four hospitals. The challenge observed in Indore appears linked more to site-level awareness, maintenance follow-up, and fault management than to any broader limitation of the intervention itself.

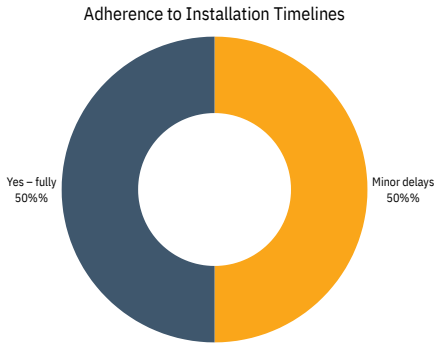
Effeciency

The efficiency dimension was assessed to understand how smoothly the project was implemented across the selected hospitals, including coordination during installation, adherence to timelines, and quality of execution.

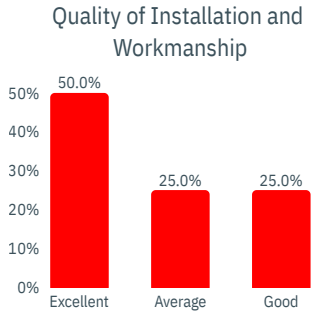


Excellent Vendor Coordination During Installation

Most respondents reported a positive experience of vendor coordination during installation. 75% rated coordination as excellent, while 25% rated it poor. This indicates that coordination with hospital authorities was smooth in most of the assessed sites.
Field interactions also suggest that the vendor remained supportive during installation and made practical adjustments where needed to suit hospital requirements. However, in a few cases, coordination was affected by internal administrative processes.



Responses show a mixed but broadly satisfactory picture with regard to installation timelines. 50% of respondents stated that timelines were followed fully, while 50% reported minor delays. This suggests that installations were largely completed as planned, with only limited delays in some locations. Discussions with stakeholders indicate that such delays were mainly linked to approvals, paperwork, and electricity-board related procedures rather than installation work itself.



Survey responses suggest that the quality of installation and workmanship was satisfactory overall. 50% of respondents rated it as excellent, 25% as good, and 25% as average. This indicates that the physical execution of the systems was viewed positively in most hospitals.
Observation findings also support this. Core technical and safety elements such as panel installation, inverter setup, cabling, earthing, mounting structure, signage, and metering were largely found in place. At the same time, some gaps were observed in maintenance schedule display, contact detail display, and availability of manuals or warranty documents.

Qualitative inputs suggest that installation was generally completed in a functional manner, but post-installation efficiency depended on how actively hospitals followed up on cleaning, monitoring, and issue reporting. In some cases, clarity on documentation and support processes was limited, which affected overall system management efficiency.

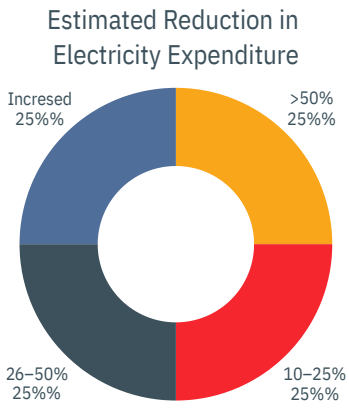
> "There are some documents that need to be signed with DISCOM, and hospital administrations sometimes hesitate to sign them, which can lead to delays in the installation process"

Vendor representative

Overall, the project shows satisfactory efficiency in terms of installation coordination, timelines, and workmanship, while the main gaps were related to documentation, follow-up, and post-installation process management.

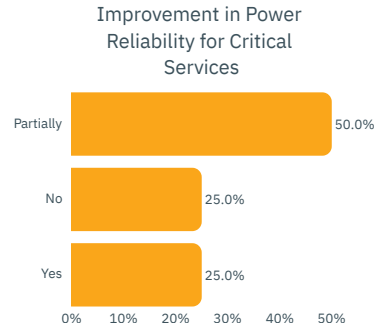
Impact

This section presents the impact of the solar installation project based on responses from hospital representatives, stakeholder interactions, and field observations. It examines the broader changes observed in electricity expenditure, institutional energy use, green energy adoption, and the longer-term value of the solar systems within the selected hospitals.



Survey responses indicate that the project has started generating visible financial impact across most of the assessed hospitals.

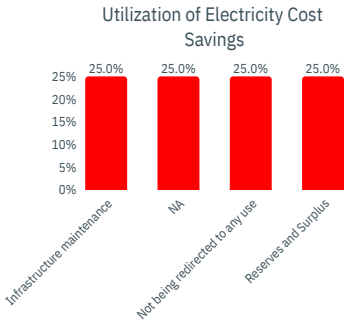
25% of respondents reported an estimated reduction in electricity expenditure of more than 50%, 25% reported a reduction of 26–50%, and another 25% reported a reduction of 10–25%. Only 25% reported that expenditure had increased, which corresponds to the Indore site already discussed in the earlier sections. This shows that in three of the four assessed hospitals, the solar installations have contributed to lowering recurring electricity costs, though the extent of savings differed across sites.



Survey responses on power reliability present a more moderate picture. 50% of respondents stated that reliability for critical services had improved partially, 25% reported a clear improvement, and 25% reported no improvement. This suggests that the project's impact on power reliability was present, but not equally strong across all assessed hospitals

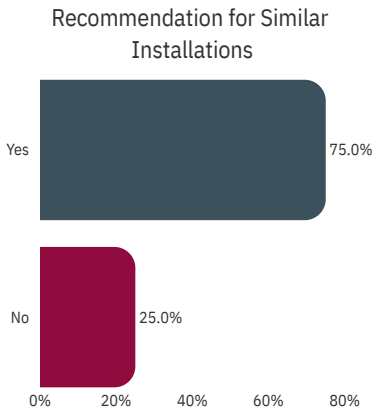
Qualitative findings help explain this pattern. In at least one site, electricity supply was already relatively stable due to the presence of a dedicated high-tension line, so the solar system contributed more towards cost reduction and energy diversification than towards major improvement in reliability. At the same time, field inputs from Jaipur indicated that the system was meeting a substantial share of the Dharamshala's energy demand, showing that the project can also strengthen energy resilience where the institutional set-up allows it.

Responses on utilisation of savings show that the financial benefits have not yet translated into a uniform pattern of reallocation. 25% of respondents stated that savings were being used for infrastructure maintenance, 25% reported that they were going into reserves and surplus, 25% said that the savings were not being redirected to any use so far, and 25% marked NA. This indicates that while savings are visible in some



hospitals, their use is still evolving and may depend on the administrative and financial systems of each institution.

Inputs from Aavas Foundation also suggest that one of the intended impacts of the project was to help hospitals use saved resources in other public utility areas over time. The current findings indicate that this potential is present, but the reallocation of savings is not yet consistent across all assessed sites



Stakeholder acceptance of the intervention appears strong. 75% of respondents stated that they would recommend similar installations in other public hospitals, while 25% did not. This indicates a broadly positive perception of the project's value and replicability.

Green Energy and Long-Term Environmental Value

Beyond the immediate institutional benefits, the project has created a more structural form of impact by establishing renewable energy infrastructure within public healthcare institutions. Project records place the intervention under the theme of Environment Sustainability, Climate Change and Energy, with the objective of promoting green energy and lowering electricity costs in government hospitals. Aavas Foundation also noted that the project is intended to support reduction in carbon emissions and strengthen renewable energy use in public institutions. In this sense, the impact of the project goes beyond short-term bill savings. The installed systems represent long-term infrastructure that can continue contributing to cleaner energy use, lower dependence on conventional electricity, and more sustainable hospital operations over time.

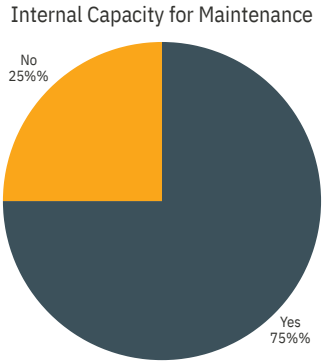
The reduction in travel and hospital visits is also reflected in the benefits reported by beneficiaries. 54% experienced less travel and 60% reported lower spending on travel. These changes indicate a reduction in the economic and time burdens traditionally associated with healthcare seeking in rural areas.

> "It will help in reducing the carbon emission, reduce the electricity cost for the government hospitals and promote the renewable energy."

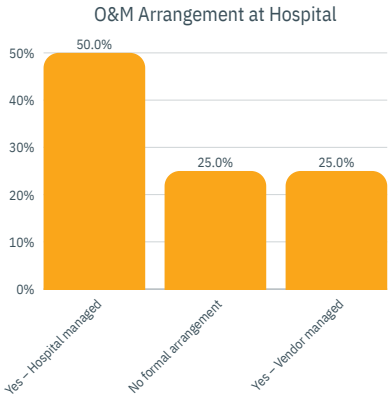
Aavas foundation representatives

Sustainability

The sustainability of the solar installation project depends on whether hospitals are able to maintain the system, understand the support arrangement, and carry forward basic monitoring and upkeep over time. The findings suggest that while the project has created a useful long-term asset, sustainability at the hospital level is still uneven, mainly because awareness and ownership are not equally strong across all sites.

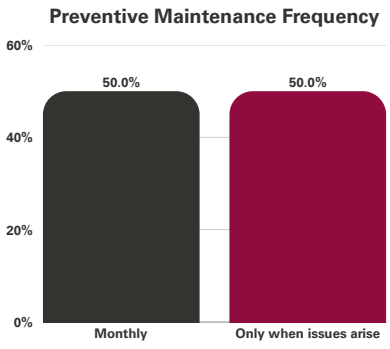


Survey responses show that 75% of respondents felt that the hospital does not have internal capacity to maintain the solar system in the long run, while only 25% felt such capacity existed. This indicates that long-term sustainability is still dependent more on external support than on in-house systems.

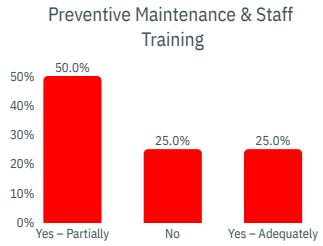


A similar pattern is seen in the responses on O&M arrangements. While 50% reported that the system was hospital managed, 25% reported it as vendor managed, and 25% said there was no formal arrangement. However, this needs to be read with the qualitative inputs from Aavas Foundation and the vendor, both of whom clarified that the project includes a 2-year A&M / O&M contract. In practice, only Jaipur clearly mentioned this, while other hospitals either treated it as hospital managed or were not aware of the arrangement. This suggests that the main issue is not absence of support, but limited awareness at the hospital level about the formal maintenance structure.

This is also reflected in the response on duration of the O&M contract, where only 25% reported 2 years and 75% marked it as not applicable. Since the project-side discussion confirms a 2-year arrangement, these responses again point to weak institutional clarity rather than actual absence of maintenance support.



On preventive maintenance, the findings are split: 50% reported that it is carried out monthly, while 50% said it happens only when issues arise. This shows that maintenance practices are not yet uniform across sites. In some hospitals, upkeep appears more routine, while in others it remains reactive.



The picture on staff training is also moderate rather than strong. 50% said staff had been trained partially, 25% said adequately, and 25% said no training had been provided. Qualitative inputs indicate that the vendor did explain some basic aspects, especially panel cleaning, but this seems to have remained limited and informal rather than a fully structured handover. This is important because long-term sustainability depends not only on the system being installed, but also on hospital staff knowing basic operation, cleaning, and whom to contact in case of issues.

Overall, the project has created the technical base for sustainability through installed infrastructure and a defined support period. However, long-term sustainability at site level is still partial, because hospital ownership, awareness of O&M arrangements, and basic operational understanding remain inconsistent. Going forward, sustainability will depend on stronger site-level clarity, simple maintenance guidance, and better institutional ownership of the system.

Key learnings & Reccomendations

Strengthen hospital-level ownership and basic system awareness

The assessment shows that the long-term performance of the solar systems depends not only on technical installation, but also on how well hospital teams understand basic monitoring, panel cleaning, and fault reporting. In some hospitals, awareness of O&M arrangements and routine upkeep responsibilities was limited. Providing a simple handover kit, basic orientation for relevant staff, and clear display of support contacts can improve ownership and reduce avoidable performance gaps.

Improve routine maintenance practices and basic system upkeep

Across several hospitals, preventive maintenance, especially panel cleaning was irregular or reactive. Dust accumulation directly affects energy generation efficiency, particularly in campuses with open terrace installations. Introducing a structured monthly cleaning schedule, maintaining a simple checklist, and assigning clear responsibility to a designated staff member will help maintain system output and prevent avoidable performance dips.

Enhance documentation availability and knowledge transfer

Observation checklists showed that system documentation such as warranty cards, inverter manuals, and component details were missing in some hospitals. For long-term sustainability, document packets should be handed over in physical and digital form, with teams informed where these materials are stored. Clear documentation supports easier troubleshooting, better compliance, and smoother coordination with vendors.

Promote institutional ownership through periodic orientation

Hospital teams expressed that initial guidance was provided by the vendor, especially on cleaning panels and basic checks, but follow-up training has been limited. Short, periodic orientation sessions for engineers, electrical staff, and administrative teams can reinforce system understanding, strengthen confidence, and reduce dependency on external support for minor issues.

Case Study

Solar installation strengthening operational efficiency and cost savings at Rajkiya Dharmashala, SMS Hospital

A Key Informant Interview (KII) was conducted in Jaipur with the CMO Office and the operations team representatives of Sawai Man Singh Hospital (Rajkiya Dharmashala) to understand the implementation and performance of the solar energy project supported under the CSR initiative of Aavas Financiers Ltd. The discussion focused on system functionality, operational performance, maintenance mechanisms, and the overall institutional value of the intervention. The stakeholders expressed a high level of satisfaction with the project and shared that the solar installation has become a useful support to the Dharamshala's day-to-day functioning.

As mentioned by the CMO Office and the operations team, the solar system is currently meeting around 80% of the Dharamshala's total energy demand, thereby reducing dependence on grid electricity and contributing to visible cost savings. This is also reflected in the survey findings, where Jaipur reported a reduction in the average monthly electricity bill from around ₹90,000 before installation to about ₹40,000 and even less than that after installation. The site also reported a positive experience with operations and maintenance support, with stakeholders noting timely servicing, regular monitoring, and prompt technical assistance whenever required.

Overall, the Jaipur case reflects how a well-functioning solar installation can create both operational and financial value in a public hospital setting. Beyond reducing electricity expenditure, the intervention was appreciated for improving energy reliability within the Dharamshala premises and for contributing to environmental responsibility through cleaner energy use. The feedback from the CMO Office and hospital team suggests that, at this site, the project has emerged as a practical and sustainable institutional asset.

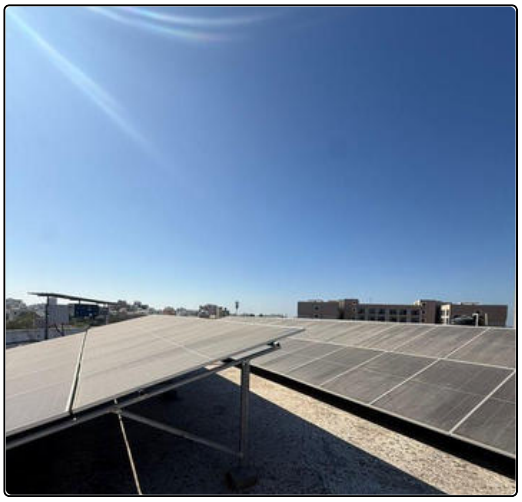
Ethical Considerations

- The purpose of the assessment was clearly explained to all respondents, and informed consent was obtained before surveys and interviews were conducted.
- Participation was voluntary, and respondents were informed that they could choose not to answer any question or discontinue the interaction at any stage.
- The assessment primarily involved institutional stakeholders, and care was taken to ensure that responses were recorded respectfully and without influencing their views.
- No personal or sensitive information of respondents has been disclosed in the report, and findings have been presented in aggregated form.
- During hospital visits and stakeholder interactions, due care was taken to avoid disruption to routine hospital functioning and administrative processes.

Study Limitations

- The assessment was based on field visits to four selected hospital sites and therefore may not fully capture variations across all project locations.
- As this is a relatively recent infrastructure intervention, some of the longer-term outcomes related to savings utilisation, institutional strengthening, and sustainability may take more time to fully emerge.
- The study relied partly on stakeholder-reported information, which in some cases was influenced by limited institutional records or varying levels of respondent awareness.
- During the field visit at the Indore site, hospital stakeholders had limited awareness regarding system components, system functioning, and maintenance arrangements. This restricted the depth of site-level validation on certain operational aspects..

Annexure

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