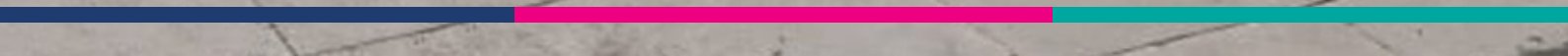




**Project Accomplishment Report**  
**2022-23**

**Powering Healthcare Facilities**  
(Solar Electrification of 8 PHCs in Hardoi, Uttar Pradesh)







## Background

Primary Health Centers (PHCs) in remote areas of India have challenges in gaining access to reliable and uninterrupted electricity which significantly affects the delivery of essential primary health care emergency health services. The Essential primary healthcare services include out-patients (OPD), in-patients (IPD), emergency care, referral care, laboratory services, and delivery services. To provide access to quality and timely care for the population, especially in cases where the Community Health Centre (CHC) or the District Hospital is over an hour away or is not easily accessible, the Indian Public Health Standards (IPHS) recommends that PHCs should become functional round-the-clock, with the provision of 24x7 nursing facilities. Such PHCs (when the CHC is over an hour away) should also provide 24x7 emergency care (IPHS, 2012). A reliable power supply ensures that core systems for the management of health programs can function effectively. As the World Health Organization (WHO) observes, “energy access in health facilities is a critical enabler of access to many medical technologies, and thus to health services access. Without energy, many life-saving interventions cannot be undertaken”.

As per CEEW’s (Council on Energy, Environment and Water) report<sup>1</sup> on Powering Primary Healthcare through Solar in India, out of the functional PHCs in India, about 4.6 percent are unelectrified, affecting over 38 million rural households. One out of every two PHCs in the country suffers from an unreliable power supply or has no electricity access at all. About 90 percent of PHCs reported power cuts during peak operating hours. One-third of the PHCs experienced power cuts in the evening. More than 21 percent of the PHCs reported damage of medical equipment due to voltage fluctuations. Through this project, we propose to install a solar system in identified 08 PHCs across the Hardoi district of Uttar Pradesh as an alternative power source to provide uninterrupted healthcare services to the poor and underprivileged people in the area. Solar has emerged as a reliable power backup to PHCs, especially during peak load hours and after sundown. It could potentially be a primary mode of power supply. 90 percent of the solar-powered PHCs reported cost savings from using solar PV systems over diesel generators. The ability of solar-powered PHCs to operate cold chain equipment for storing vaccines and drugs, and new-born care equipment has improved significantly. It is also found that higher comfort due to better lighting and running fans has managed to increase patients’ willingness to get admitted. Solar-powered PHCs have been reported to admit over 50 percent more patients and conducted twice the number of child deliveries in a month compared to power-deficit PHCs without a solar system.

## Project Goal

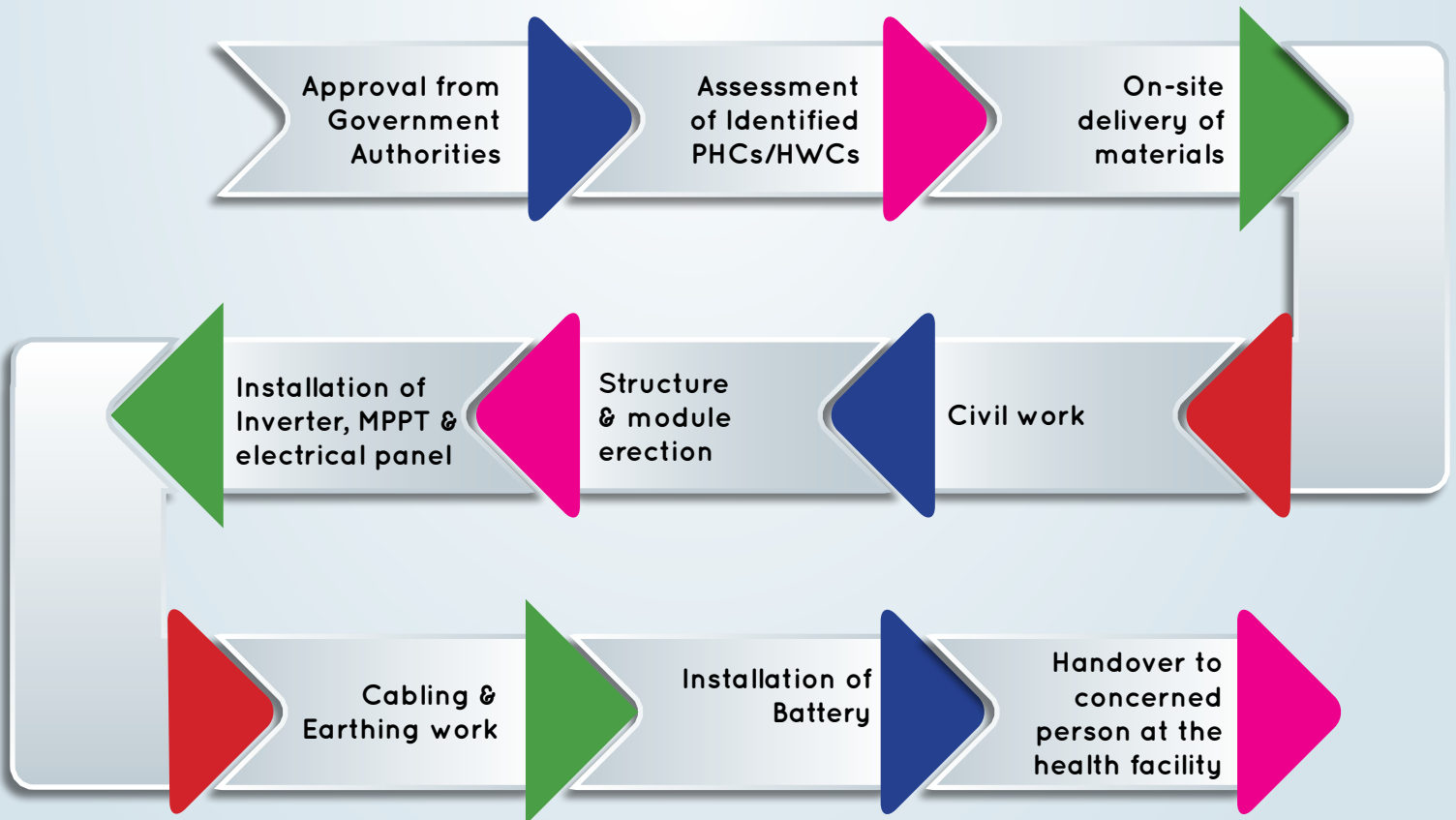
To ensure uninterrupted healthcare service delivery for communities through solar electrification across 8 PHCs/HWCs in Hardoi district of Uttar Pradesh.

## Project Location

8 PHCs across Hardoi district, Uttar Pradesh

S. No.	Block	Health Facility
1	Bawan	HWC Barvan
2	Shahbad	HWC Dalelnagar
3	Bharkhani	HWC Anangpur
4	Harriyawan	HWC Sumai
5	Pihani	HWC Jahanikheda
6	Sandi	HWC Gurra
7	Harpalpur	HWC Alliganj
8	Todarpur	HWC Alamnagar

## Implementation Process



## Impact of solar electrification

In semi-urban and rural regions of India and other developing countries with unreliable power grids, decentralized renewable energy — especially solar — is making all the difference in delivering modern health care. And it's becoming even more indispensable where heat and weather extremes are increasing due to climate change. With the installation of solar rooftop panels, the 8 Primary Health Centers (PHCs) in Hardoi have a better source of energy, especially during peak hours when these centers see the most patients and solar energy is at its highest potential due to central India's climate. Also, solar power is reliable, clean, and half as cheap as diesel.

The patient load at health centers in rural areas is highest during the day which makes a compelling case for the use of off-grid solar as a primary mode of electricity, as opposed to an on-grid system (which remains the secondary mode). The solar panels store enough sunlight during the day, using the excess power generated at night.

Many health improvement schemes like providing pediatric care, new-born emergency services, and successful vaccination rely heavily on the availability of electricity at the health centers. The Electrification project has empowered the 8 PHCs and is generating enough power which is needed to operate and sterilize medical equipment, refrigerate vaccines, improve patient access and staff retention, reduce absenteeism, and make working conditions at facilities safer. Electricity access can also enable remote health facilities to connect with specialists via telemedicine initiatives.

## Solar electrification and Environment

1. **Renewable energy source:** Solar energy is a renewable source of energy, which means it can naturally regenerate itself and can be used over and over again with minimum environmental impact.
2. **Reduces air pollution:** Solar energy is a sustainable and clean source of energy that doesn't produce harmful particulates in the air. So, it reduces air pollution and makes our cities healthier places to live in.
3. **Reduces greenhouse gas emissions:** Solar energy can help to reduce the amount of greenhouse gases released by human activities in our atmosphere, which is a contributor to climate change
4. **Require no additional infrastructure:** One of the biggest benefits of solar energy is that it doesn't necessarily require additional infrastructure. Solar panels can simply be installed on existing buildings and homes, which means there's no need for new buildings to be built in order to accommodate the installation.
5. **Provides power to remote locations:** Similarly, solar energy can provide power to remote locations without having to build costly and environmentally damaging infrastructure to connect to the grid.

- 6. Recyclable:** Solar panels are made from a variety of materials, including silicon and silver. These materials can be recycled at the end of their useful life, that is about 30 years.
- 7. Reduces reliance on fossil fuels:** The extraction of fossil fuels is a major contributor to human-induced climate change, as well as having many harmful side effects on the environment. Solar energy is renewable and cleaner than fossil fuels, which means it's helping to reduce these issues.

## Solar System Details

At each PHC, 20 solar modules with a capacity of 6.7 kW, per module capacity 335 W with a 6kW capacity Inverter have been installed. Along with this, a 48V 300 ah VRLA Battery and 3kW MPPT are installed. The Solar system will generate 25 units per day on each site enough to run one computer, one refrigerator, 15 tube lights, 15 fans, 10 CFL, one water pump, two exhaust fans and two coolers for the time PHC is operational. The solar panels have a warranty of 25 years, the battery has a warranty of 5 years and Inverter has a warranty of 3 years.

## Monitoring System

The monitoring system inclusive of this package makes it exceptional. A solar monitoring system will allow us to keep track of the output of solar panels. Knowing how efficient solar panels are at producing energy means we can keep the panels at their highest efficiency and detect any potential damage to the panels. The key to solar monitors is in the software, which can be used to detect errors or hardware defects, as well as monitor current system output. It can also help us to monitor carbon emissions.

## Sustainability

Solar-powered technologies are empowering small and remote locations, giving communities and villages access to power generation, which would otherwise be impossible to achieve. Small-scale and portable technologies have allowed rural or poor villages across the world to power essential technologies and improve their quality of life. Therefore, solar electrification of the 8 PHCs has the potential to make a very positive difference across the communities it caters to, whether it be for basic lighting, equipment, water pump, or for keeping vaccines - solar panels are showing their social and economic sustainability benefits. Also, post the completion of the project, the solar system has been handed over to the designated person at the government health facility who will keep a check and maintain the system.



# Glimpses from the Field

HWC Barvan





# HWC Dalelnagar





## HWC Anangpur





# HWC Sumai





## HWC Jahanikheda





# HWC Gurra



हेल्थ एवं वेलनेस

- अंतर्गत की सेवाएँ की जाँच एवं सुधार
- अंतर्गत, अंतर्गत की जाँच एवं सुधार
- अंतर्गत की जाँच एवं सुधार

हेल्थ एवं वेलनेस

शिक्षिका अधिकारी / स्वास्थ्य

क्र.	नाम	पद
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## HWC Alliganj





## HWC Alamnagar





## Conclusion

Access to electricity in healthcare facilities is an important factor in the efficacy of health service delivery. Even though 91 percent of PHCs in India had electricity connections in 2012-2013, almost half of them had irregular power supply. Solar electrification lessens the health center's dependency on conventional energy, lowers electricity bills, and contributes to a reduced carbon footprint. One of the key outcomes is also that the health services are turning sustainable in operations. It helps in a better footfall of patients, optimum service delivery, and retention of the health staff contributing towards a healthy community. **The intervention will support approximately 33,000 people per year through 1 PHC amounting to an estimate of approximately 2,60,000 people through 8 PHCs.**



# ABOUT PPHF

We are a global health non-profit organization working towards transforming lives for improved health and wellbeing through locally-driven solutions. We have worked in more than 20 states of India with an aim to build the skills of health care providers, strengthen management capacity and help create sustainable systems to improve access to quality health services.

We work closely with communities and key actors on sustainable solutions for public health challenges:

- Non-Communicable Diseases
- Women, Adolescent and Child health
- Nutrition
- Infectious diseases
- Environmental Health
- Emergency Health and Disaster Response

We focus on building public health capacity and community actions for better health outcomes. We work collaboratively with stakeholders, leveraging partnerships and influencing policies and practices. Drawing on our experiences and recognizing the unique needs of each region in India, We work in partnership with key stakeholders to design and deliver targeted responses.

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## Contributor

People To People Health Foundation

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