MAMTA HIMC
BRIDGE TO HEALTH & BEYOND

SmartPowerIndia

Energy Efficient and Climate Friendly Hospitals through Solarization

Studying energy efficiency and climate-friendly health care systems in 20 blocks of **Mirzapur** and **Varanasi** in **Uttar Pradesh.**

The study has been commissioned by **Smart Power India.**

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Objective of the project is to understand energy-efficient and climate-friendly health care systems in two districts, Mirzapur and Varanasi, of Uttar Pradesh.

A total of 20 blocks in the two districts were identified for intervention under this program.

8 blocks in Varanasi district	12 blocks in Mirzapur district

The key program interventions were implemented in the following order in the program mentioned below:

A) Entry-level activities:

- Mapping of the available healthcare facilities in the two districts.

B) Program Interventions:

- Sensitization of hospital management, with high patient footfall, were prioritized and their assessment was done using a predefined questionnaire.
- Meetings and sensitization sessions with the Indian Medical Association (IMA), Indian Association of Paediatrics (IAP), National Integrated Medical Association (NIMA) and other influencers were conducted who supported the project's vision by communicating the same to other members of their forum.
- Teams visited the hospitals frequently to inform them about the project and provide them with the required information.

Implementation Framework:-

Pre-Assessment → Selection of hospitals and meeting for assessment → Lead generation and energy performance assessment → Follow up and final assessment

- Initial Survey and mapping of Hospitals
- Development of Intervention tool and application
- Meeting and sensitization of IMA, IAP & other influencers

Tools & MIS App:-

A. Development of tools:

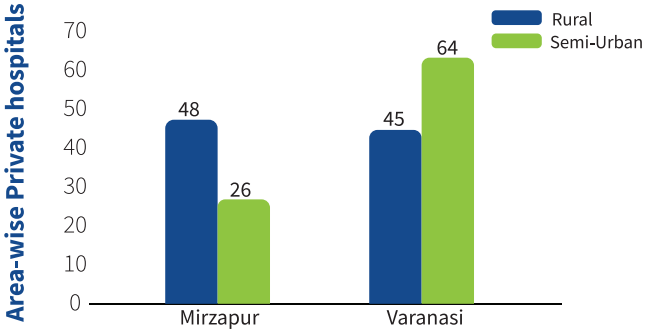
There was a series of questions associated with each thematic area. All the target indicators were taken into consideration while designing the questionnaire.

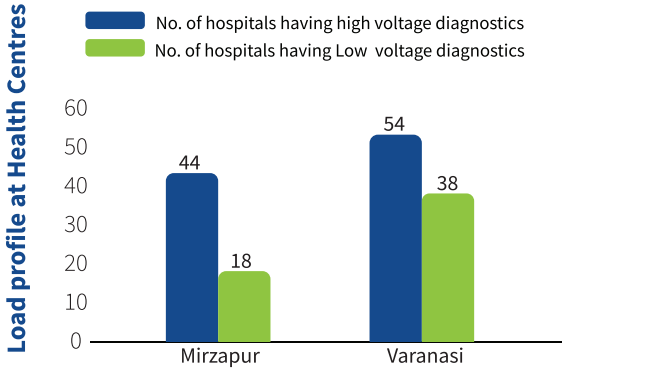
B. Developing the mobile App (Facility Assessment/ survey Questionnaire)

The mobile application for data collection was developed by the MIS team. Together with the District Coordinators, the MIS team imported the data into the mobile app.

Demographic

The teams surveyed 183 hospitals, 74 in Mirzapur and 109 in Varanasi.





Power consumption - Of the total rural hospitals covered, 65% in Mirzapur (n=48) and 31% in Varanasi (n=45) have power consumption below 100 KW. Similarly, in semi-urban setting, 89% (n=26, Mirzapur) and 38% (n=64, Varanasi) of the hospitals have power consumption in the mentioned range.

	MIRZAPUR		VARANASI	
Power Consumption	**Rural (n=48)**	**Semi-urban (n=26)**	**Rural (n=45)**	**Semi-urban (n=64)**
0-100 KW	31 (65%)	23 (89%)	14 (31%)	24 (38%)
101-1000 KW	12 (25%)	2 (7.6%)	18 (40%)	12 (18.8%)
>1000-2000 KW	4 (8.3%)	1 (3.8%)	9 (20%)	13 (20%)
>2000KW	1(2%)	0	4 (8.8%)	15 (23.4%)

Cost -

	MIRZAPUR (No. of Hospitals)		VARANASI (No. of Hospitals)	
Electricity bill	**Rural**	**Semi-urban**	**Rural**	**Semi-urban**
Up to 25000	43	21	38	45
26000-50000	4	5	7	16
>50000	0	0	0	3

Back-up source -

DG Set

	MIRZAPUR (74)	VARANASI (109)
Rural (48)	47	44
Semi-urban (26)	26	64

Inverter

	MIRZAPUR (74)	VARANASI (109)
Rural (48)	47	45
Semi-urban (26)	26	63

Solar System

	MIRZAPUR (74)	VARANASI (109)
Rural (48)	11	7
Semi-urban (26)	3	7

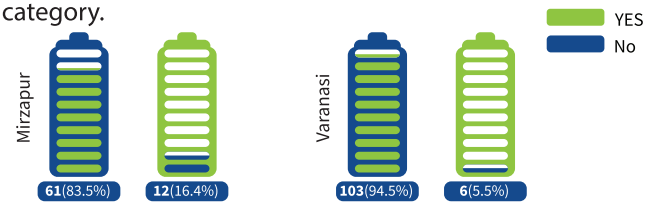
Health Care Services -

The team enquired about the average number of deliveries, surgeries and emergencies handled by the hospital in a month. The data is as follows:

	MIRZAPUR		VARANASI	
Average number of services provided per month	**Rural**	**Semi-urban**	**Rural**	**Semi-urban**
Deliveries	11.2	16.1	12.9	13.7
Surgeries	7.8	14.3	7	10.2
Emergencies	11	15.5	5.8	7.9

Need of Solar power -

In both districts, hospitals are willing and in need of alternative power sources besides diesel generators. Of the 182 hospitals, 61% in Mirzapur and 94% in Varanasi fall into this category.



Rooftop Solar- As a secondary power source -

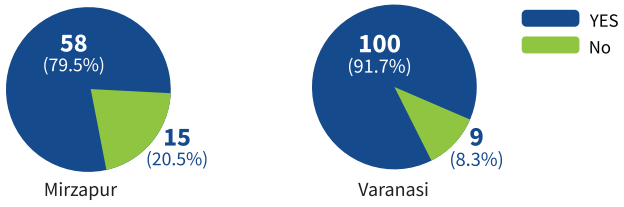
It was observed that the hospitals in semi-urban areas weren't aware of the schemes related to solar power, whereas, only 28% (52/183) of the total hospitals in rural areas were aware of them.

	MIRZAPUR (74)	VARANASI (109)
Level of awareness amongst hospitals about govt. schemes on solar power		
Yes	9 (12.2%)	43 (39.5%)
No	18 (24.32%)	11 (10.1%)
Don't know	47 (63.5%)	55 (50.5%)

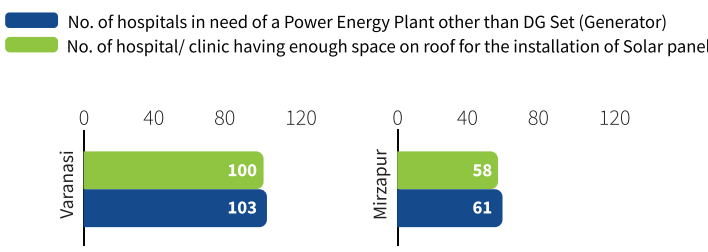
Potential for rooftop Solar -

Majority of the hospitals in the two districts i.e. 78% in Mirzapur and 92% in Varanasi have required space on rooftop for the installation of solar power

Does this hospital/ clinic have enough space on roof for the installation of solar panels?



In addition, it was observed that out of 61 hospitals that are willing and in need of power energy plant other than generator, 95% in Mirzapur and 97% in Varanasi have the required space available on the rooftop for installation



Dr. Jagdish Singh Patel, Bharat Ratna Sardar Patel Hospital, Madihan, Block-Patehra, Mirzapur

Dr. Jagdish Singh Patel (Director) stated, "Hamare hospital me 10 KW ka Solarization plant hai aur ise badha kar 50 KW karne ka plan hai. Jaldi hi hum aap logon (MAMTA & SPI) se iske liye sahyog mangenge. Iske prayog se hum aatmanirbhar rahenge. Na bijli ka intezar hoga, na diesel ka kharch. Iske prayog se pollution bhi nahin ho raha hai. Pahle voltage fluctuation ki wajah se bahut sare equipment kharab ho jate the. Diesel pe hum Rs. 90/liter kharcha hone ke karan humara operational cost bohat jada tha. Ab ye sab bachat ho rahi hai".

Dr. Mrinal Singh, Shivam Hospital, Varanasi

I am eager to install a bigger solar plant additionally for the hospital. I appreciate the efforts being done by MAMTA & SPI team related to Green Energy Initiative.

Conclusion:-

- 90% of the hospitals are in need of power supplies other than DGs
- Only 14% of health facilities have solar PV systems as a power backup
- Most hospitals have high-voltage diagnostic or other instruments
- Hospitals with solar PV systems have lower electricity bills

There are many hospitals that need a backup power source of some kind, but finding the right information can be challenging. Therefore, providing beneficiaries with accurate information is even more crucial for the RTS team. Eventually, the government may decide to solarize every public healthcare facility. A green energy awareness campaign must be designed by NGOs, and financiers must provide hassle-free financing for the installation of plants at a price that is affordable for recipients, such as hospitals.
If both the public and private sectors cooperate, we can reduce the carbon emissions caused by the extensive use of DG sets in facilities and create a healthy, pollution-free environment.