



# Renewable Energy and Health

## Insights from Chhattisgarh, India

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# CEEW – Among South Asia’s leading policy research institutions



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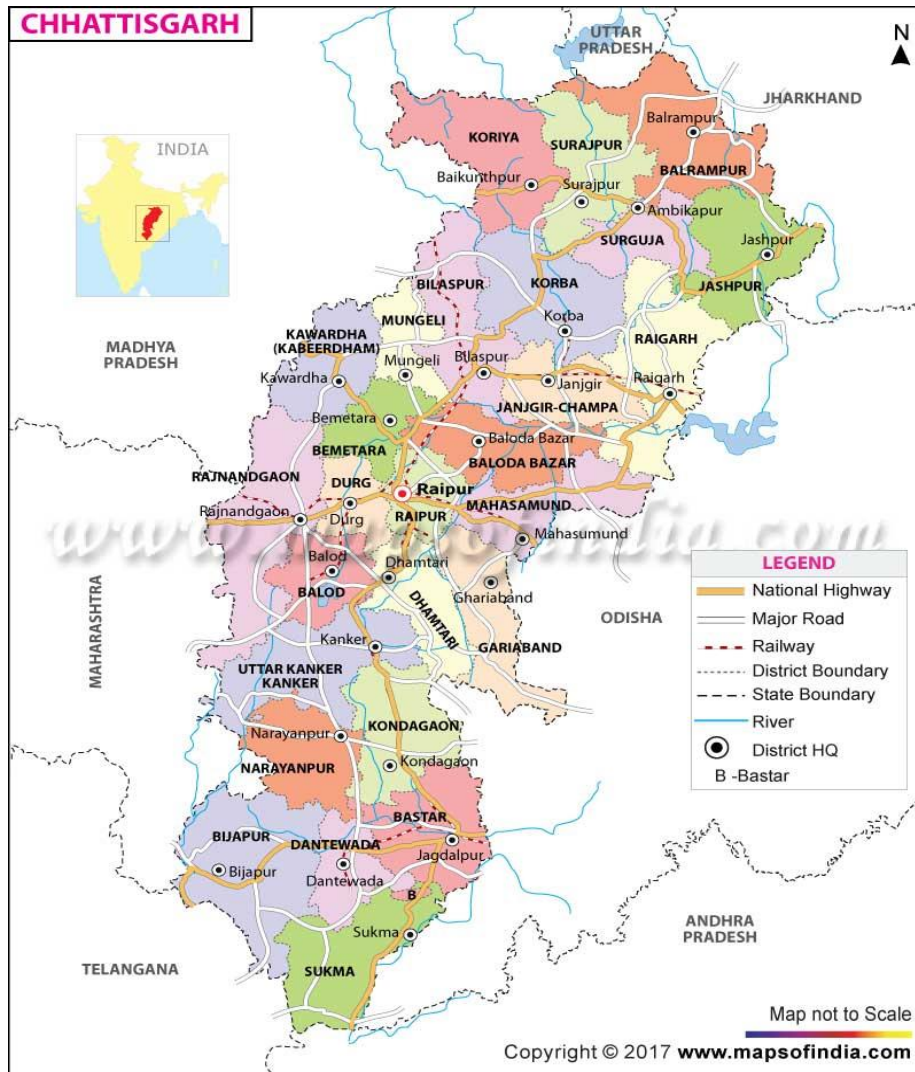


Risks & Adaptation



Technology, Finance, & Trade

# Evaluation of Solar PHCs in Chhattisgarh



- 20 million people (three-quarters living in rural areas)
- 25% (of the total 27 districts) had more than 80% fully immunized children
- One-third of PHCs are un-electrified or without regular power supply
- Close to 90% of primary health centers report power cuts during peak operating hours

Source: DLHS-4

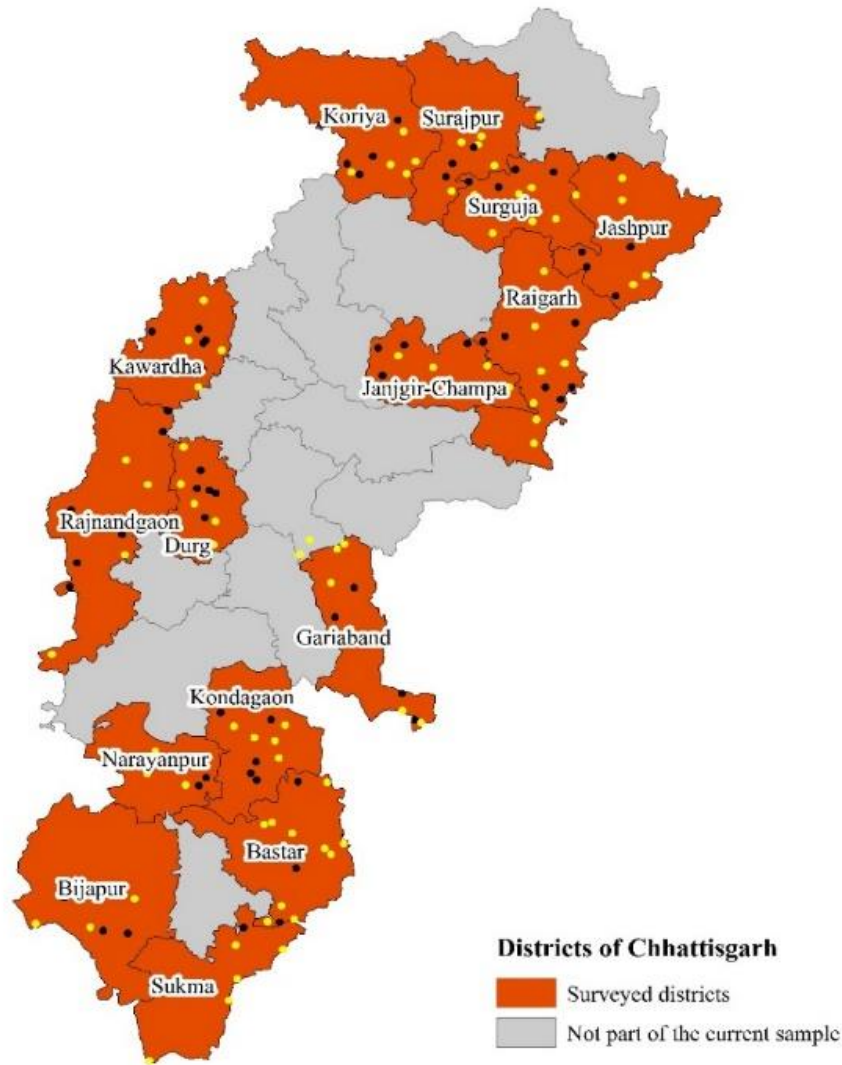
# Solar for primary health centers



- Chhattisgarh Renewable Energy Development Agency (CREDA) + National Health Mission
- 2 kWh Off-grid Solar PV systems
- 3-4 Hours of back-up, depending on load
- 600+ Primary Health Centres (PHCs) since 2012







**District-wise solar and non-solar PHCs in Chhattisgarh**

- Solar PHC
- Non-solar PHC

## Tools

- Administered a questionnaire to medical officers of all the health centres
  - Electricity supply (including back up)
  - Infrastructure including equipment inventory
  - Perceptions and experience of the solar system
  - Manpower availability
- Collected data on in-patient, out-patient and deliveries from the registers of the PHCs (aggregated by month for the last 12 months)
- Information on technical performance of the solar panels themselves (downtime, need for maintenance) from Chhattisgarh Renewable Development Authority

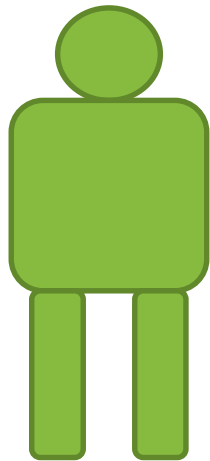
**Are the PHCs with solar performing better?**

# Better service provision in health facilities with solar

70% of health facilities with solar provided 24 x 7 services compared to 48% of those without solar

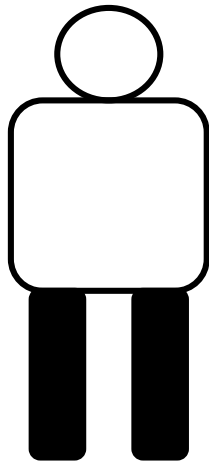
## Out-patients treated per PHC per month

With Solar



630

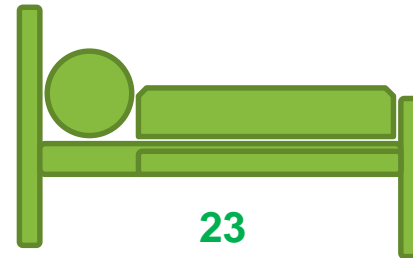
Without Solar



480

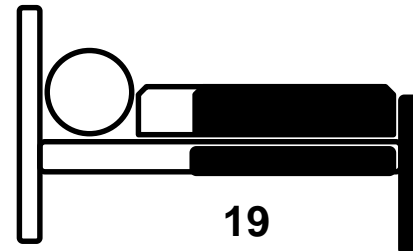
## In-patients treated per PHC per month

With Solar



23

Without Solar



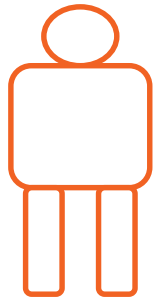
19



# Perceptions of health staff in PHCs

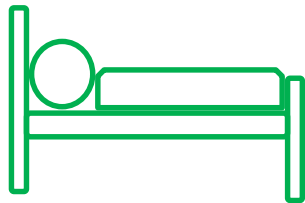
## Proportion of PHCs reporting service improvement due to solar

59%



**OPD Services**

77%



**In-patient Services**

78%



**Deliveries**

45%



**Laboratory Services**



SOURCE: CEEW ANALYSIS 2017

## Perceptions of health staff in PHCs

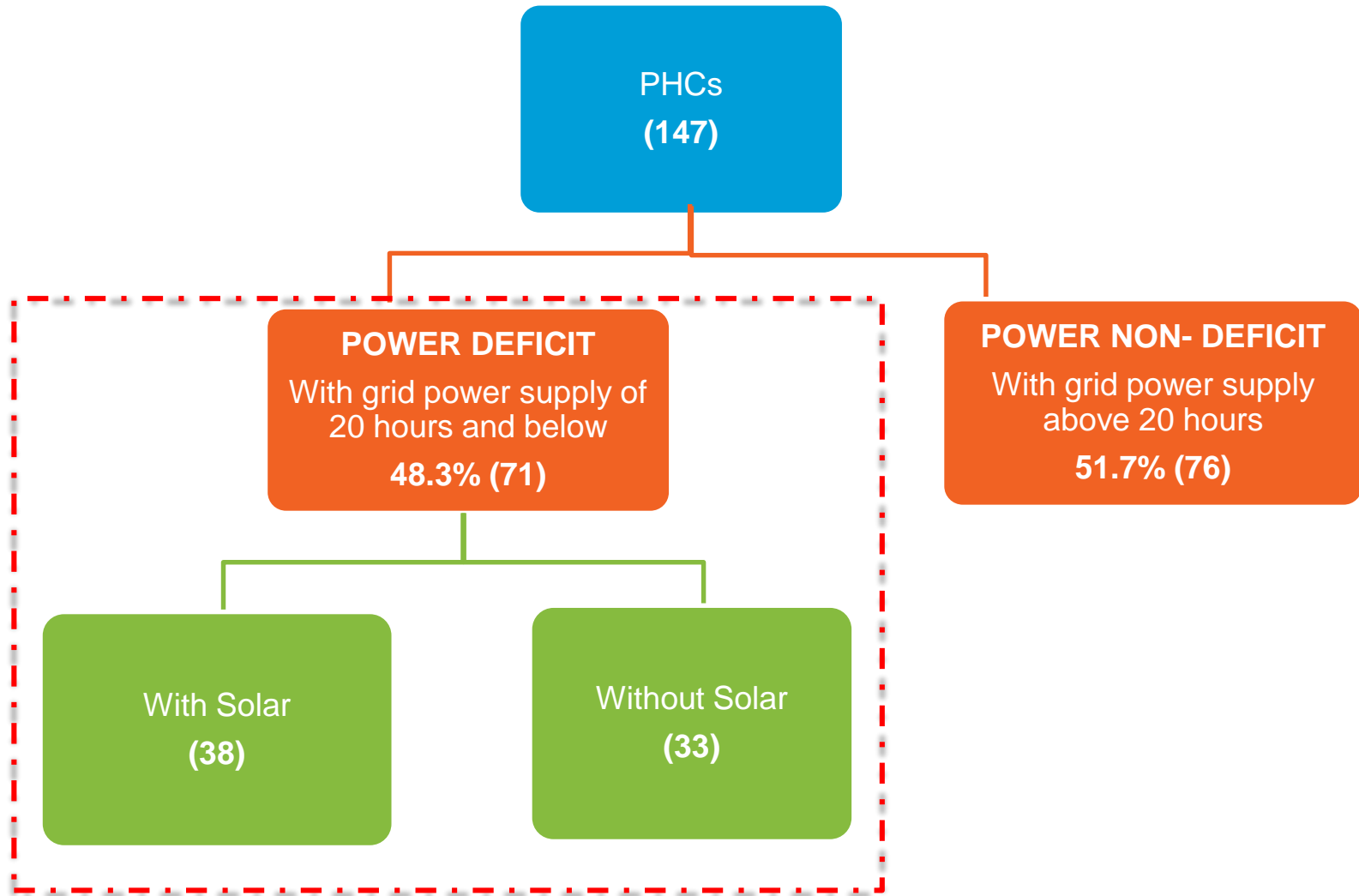
*“PHC services less affected by power cuts”*

*“Services during the night, especially delivery and emergency services, have significantly benefitted from Solar”*

*“We face less equipment damage as solar has also helped reduce voltage fluctuations”*

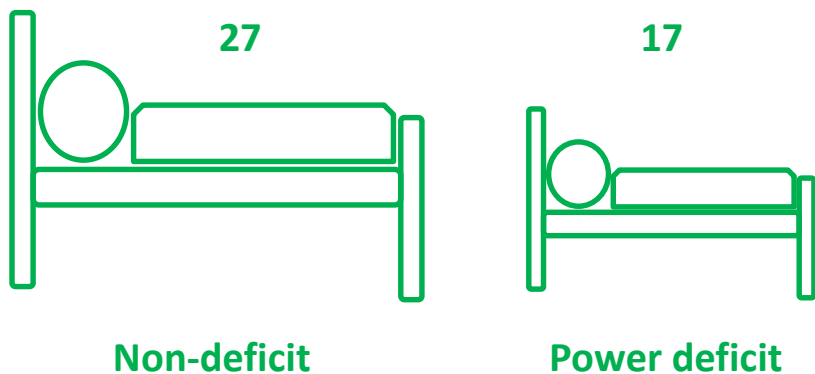
*“We would like the capacity of these systems to be expanded”*

# Lens for analysis

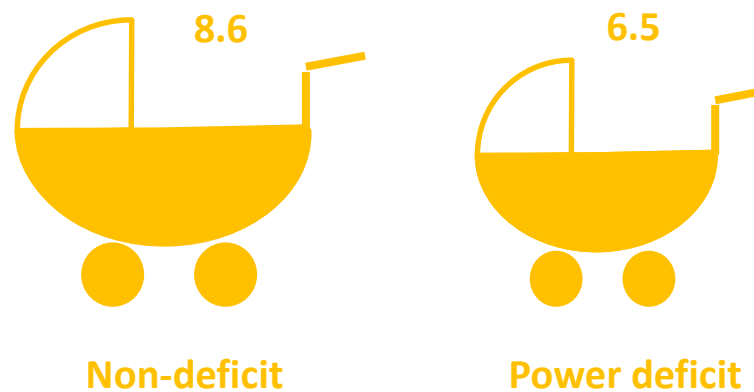


# Impacts on health services

## Average in-patients treated in a month

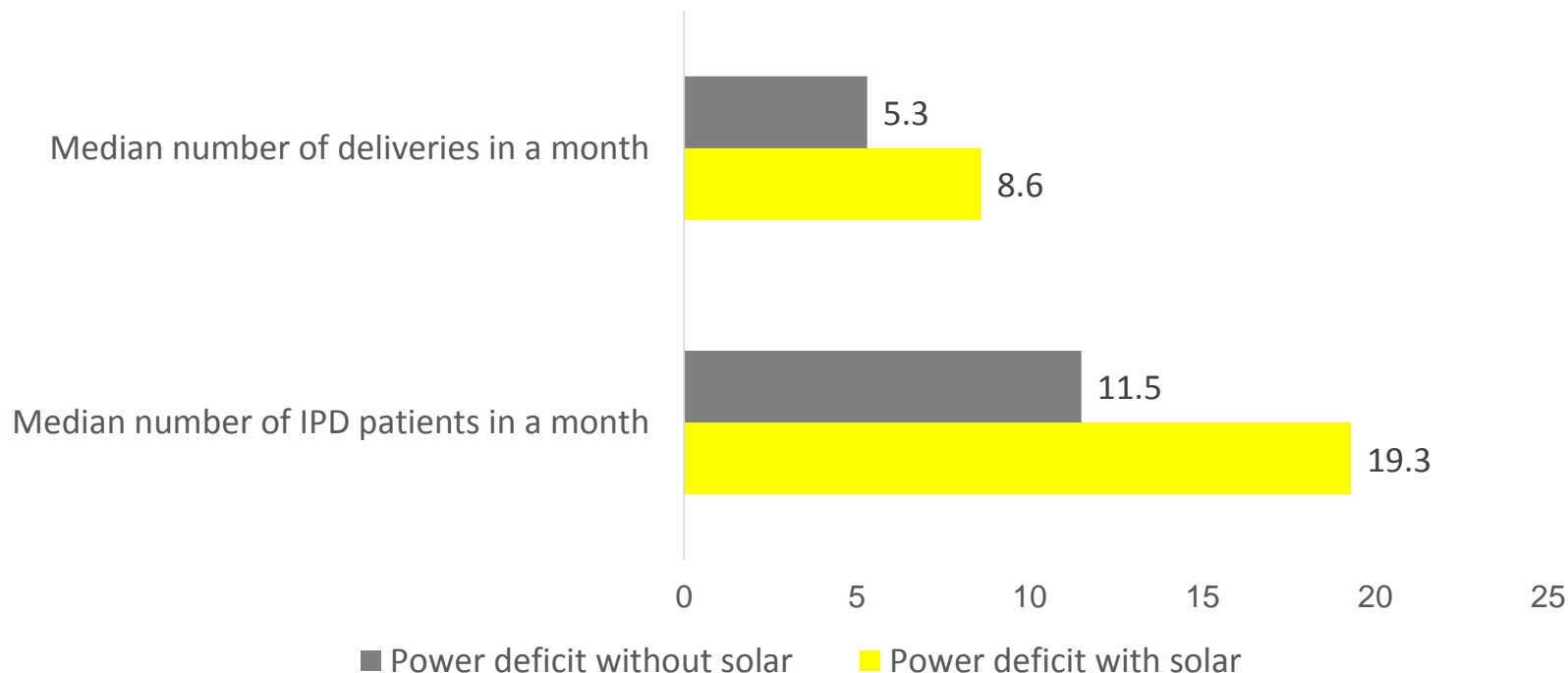


## Average Deliveries in a month

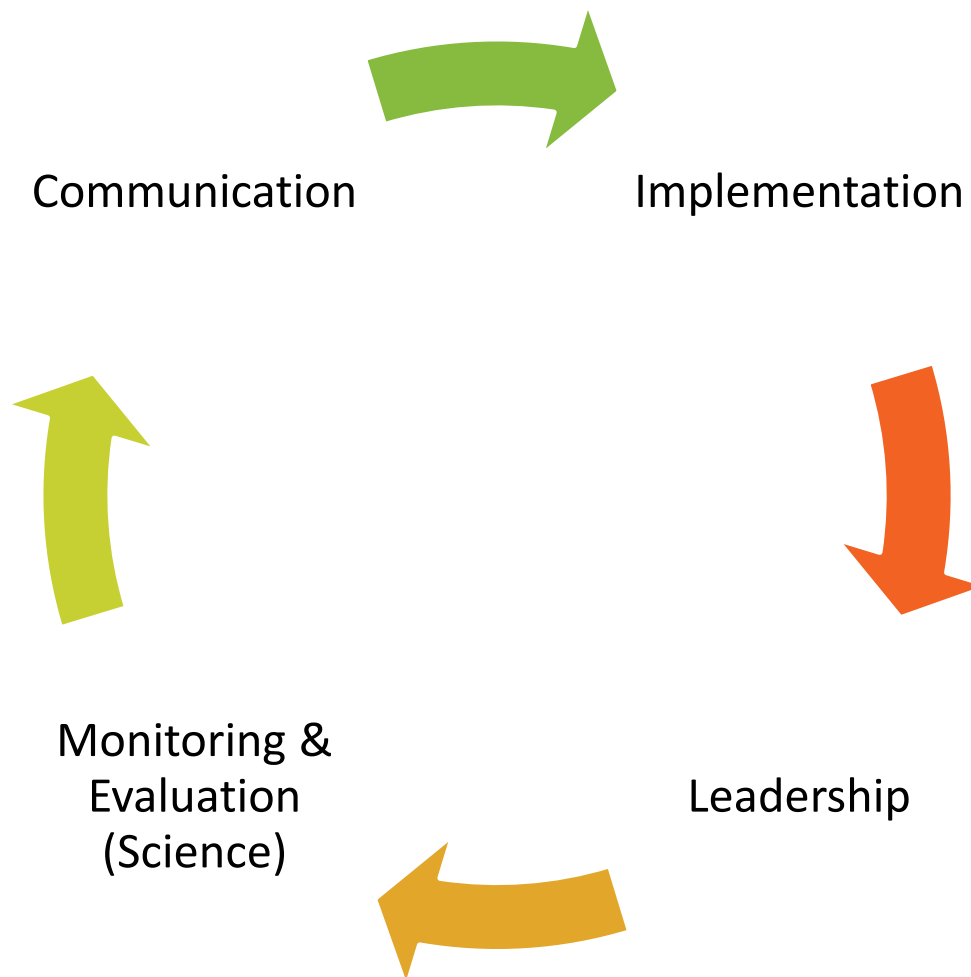


# Inpatients treated and deliveries

Median values of IPD patients and deliveries in a month - within power deficit PHCs



# Strengthening coordination across energy and health



**Thank you**

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