Renewable Energy and Health
Insights from Chhattisgarh, India

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02 November 2018
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Energy Access

Renewables

Power Sector

Industrial Sustainability & Competitiveness

Low-Carbon Pathways

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
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

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<thead>
<tr>
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<th>With Solar</th>
<th>Without Solar</th>
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<tbody>
<tr>
<td>Out-patients treated</td>
<td>630</td>
<td>480</td>
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<tr>
<td>per PHC per month</td>
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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>In-patients treated</td>
<td>23</td>
<td>19</td>
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<tr>
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Source: CEEW Analysis 2017
Perceptions of health staff in PHCs

Proportion of PHCs reporting service improvement due to solar

- **OPD Services**: 59%
- **In-patient Services**: 77%
- **Deliveries**: 78%
- **Laboratory Services**: 45%

Solar has helped the day-to-day operations of the staff/doctors in the PHC: 98%

Solar provides back-up as promised: 79.5%

Experienced cost savings on electricity expenditure: 89%

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

PHCs (147)

POWER DEFICIT
With grid power supply of 20 hours and below
48.3% (71)

- With Solar (38)
- Without Solar (33)

POWER NON-DEFICIT
With grid power supply above 20 hours
51.7% (76)
Impacts on health services

Average in-patients treated in a month

Non-deficit: 27
Power deficit: 17

Average Deliveries in a month

Non-deficit: 8.6
Power deficit: 6.5

SOURCE: CEEW Analysis 2017
Inpatients treated and deliveries

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

Median number of deliveries in a month
- Power deficit without solar: 5.3
- Power deficit with solar: 8.6

Median number of IPD patients in a month
- Power deficit without solar: 11.5
- Power deficit with solar: 19.3

SOURCE: CEEW Analysis 2017
Strengthening coordination across energy and health

Communication → Implementation

Implementation → Leadership

Leadership → Monitoring & Evaluation (Science)

Monitoring & Evaluation (Science) → Communication
Thank you

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