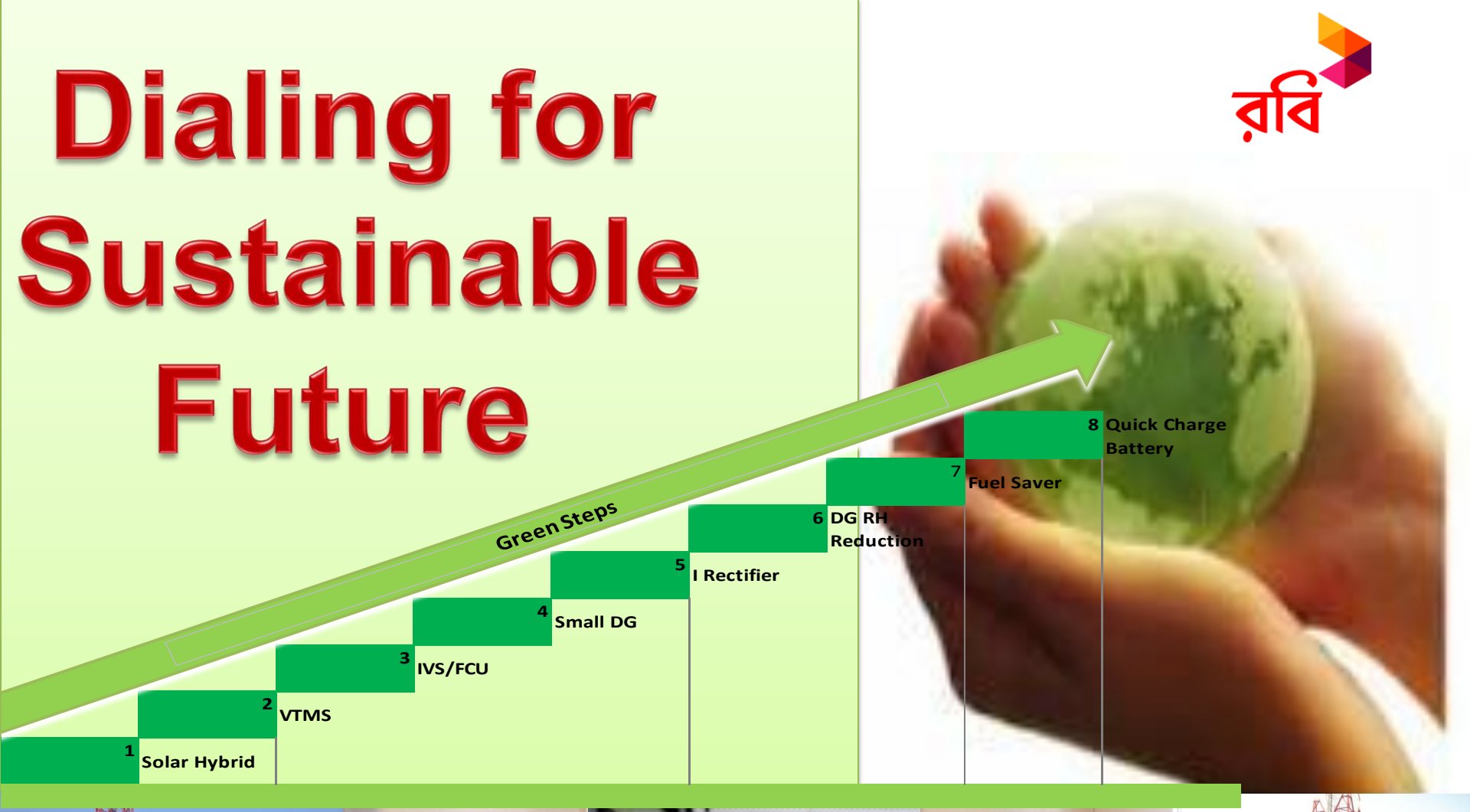
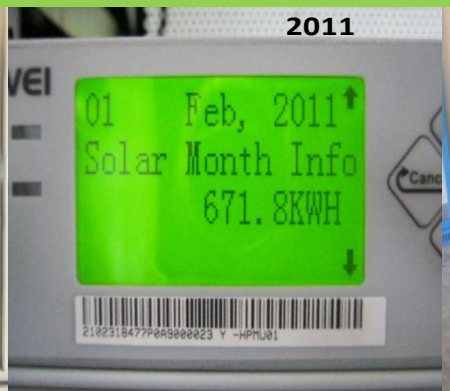
# Dialing for Sustainable Future









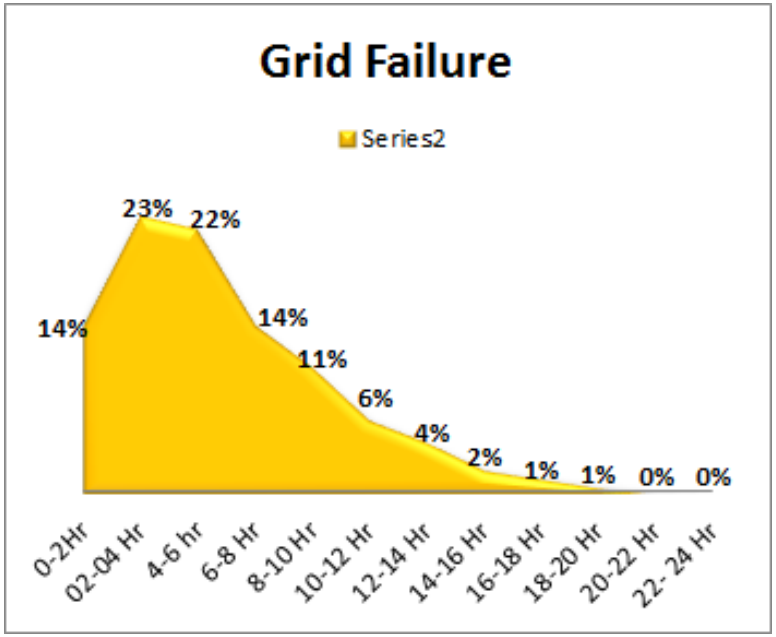





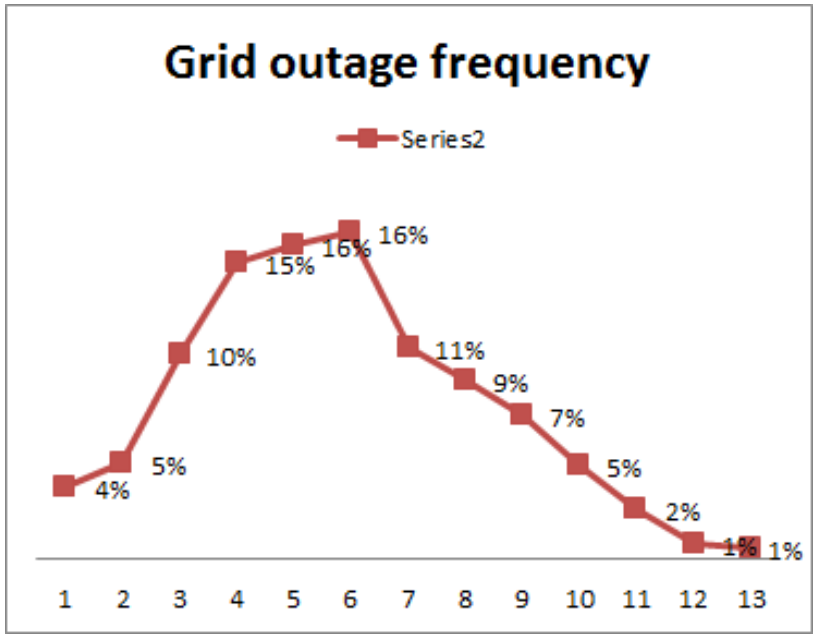




# Grid availability – Total network




**40% site**
**8Hr – 24Hr**




**36% site**
**7 Times – 13 Times**

**Note:** Data Month – May'Y12



an axiata company

# Robi towards Green

**Solar Hybrid in Off Grid Sites**

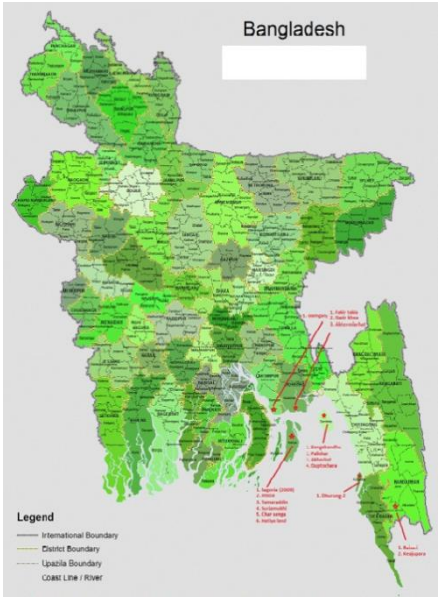
- *3.74~7.14 kWp solar module + 2 hrs genset operation*

- Deployed in 30% of off grid sites
- Deployed in southern Islands and Hill tracts
- Diesel fuel save 63%
- $CO_2$ reduction/Year 294 Ton (10.9 Ton/Site/Year)





| Site Load (kW) | Solar Plant (kWp) | 10 kW Genset RH/ Yr | Solar Production% | Genset Production% | Genset RH/ Day |
|---|---|---|---|---|---|
| 1 | 3.2 | 1403 | 51 | 49 | 3.8 |
| 15 | 3.2 | 2622 | 34 | 66 | 7.2 |
| 1 | 3.8 | 1123 | 60 | 40 | 3.1 |
| 15 | 4.5 | 2139 | 48 | 52 | 5.9 |
| 15 | 4.8 | 2001 | 51 | 49 | 5.5 |
| 15 | 5.92 | 1587 | 62 | 38 | 4.3 |
| 15 | 6.8 | 1380 | 68 | 32 | 3.8 |
| 15 | 7.14 | 1311 | 70 | 30 | 3.6 |



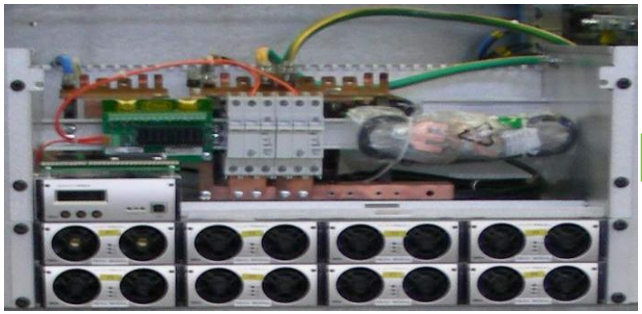
# Robi towards Green

**IVS/FCU – Cooling System**

- *EC fan Keep BTS room temperature at ambient + 2 C*
- *Site energy requirement downsized*

- Deployed in 50% of BTS sites since 2010
- BTS site power consumption reduced by 34%
- Energy saving/Year 27910 MWh (9910 kWh/Site/Yr)
- $CO_2$ reduction/Year 19250 Ton (6.83 T/Site/Yr)





**High Efficiency Rectifier**

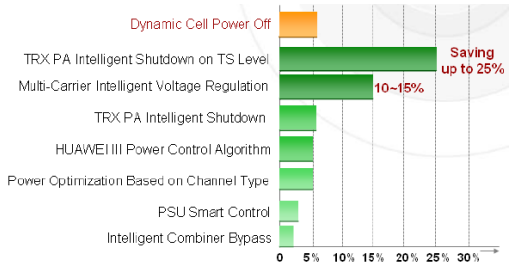
- *Efficiency 96.5%*
- *Sleep mode – energy saving feature*
- *Walk in delay – helps in genset size reduction*
- *Intelligent Genset operation and battery management*

- Deployed since July'2010
- Energy save/Year 6135 MWh (2045 kWh/Site/Year)
- CO2 reduction /Year 4230 Ton (1410 kg/Site/Year)

**Green BTS**

- *Less power consumption than traditional BTS*

- Deployed 21% of BTSs since 2010
- Energy save/Year 4022 MWh (2313 kWh/Site/Yr)
- $CO_2$ reduction/Year 2773 Ton (1595 kg/BTS/Yr)



# Robi towards Green




**Genset Resize and Operating Hour Reduction**

- *Combined effect of VTMS, High Efficiency Rectifier, Battery charging management*

- Genset RH maximum reduction from 12 hrs to 4 hrs
- DG size reduced from 27 kVA to 10 kVA
- Savings are incorporated within other initiatives

**DC DG**

- *Only 6 kW DC DG with very low sound level 58dB(A)*
- *Rectifier not required for off Grid Sites*
- *Fuel consumption 1.5 Ltrs/ Hr only*

- 20 units deployed since 2011 in space and sound issue sites
- Diesel fuel save 30~40% from conventional AC DG
- CapEx save 23%






**Quick Charging Battery**

- *Unlimited charging current within 30 C*
- *Charging current up to 0.25C at ambient temperature*
- *Reduce DG runtime thus save OpEx and reduce carbon*

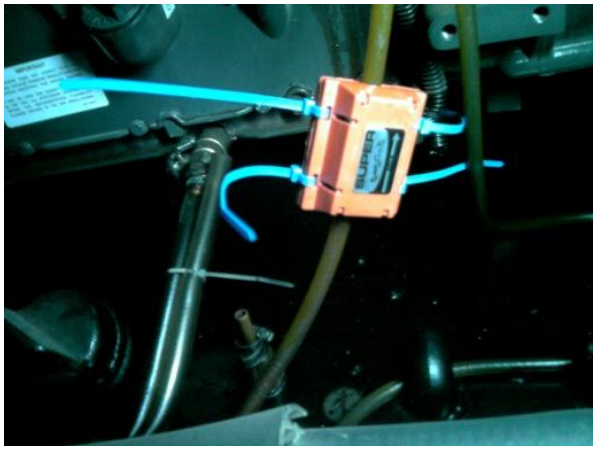
- Deployment under process
- Fuel save/year 525600 Ltrs
- $CO_2$ reduction/Year 1164 Ton

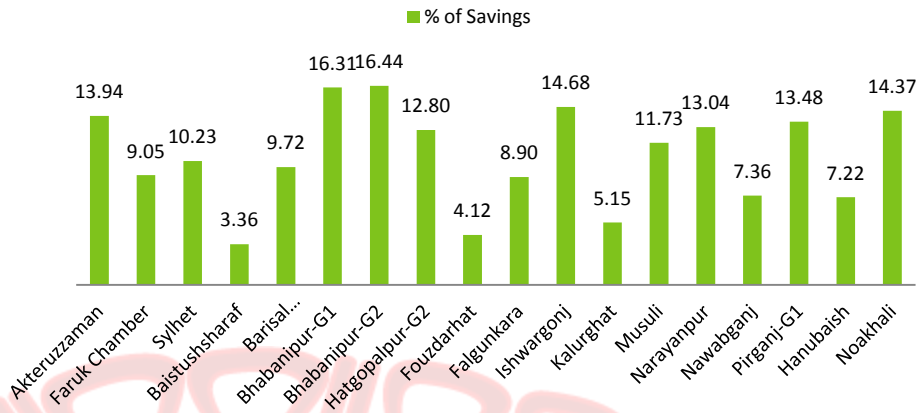
# Robi towards Green

**Fuel Saver – increases fuel efficiency**

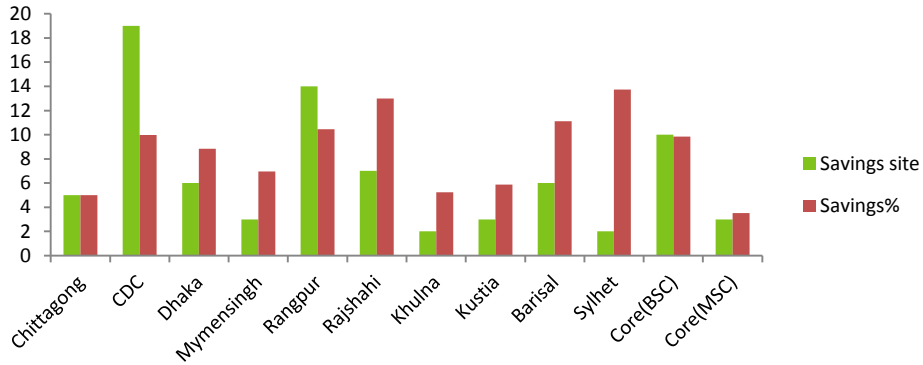
- *Magnetic homogenization of fuel helps complete burning of fuel thus increase fuel efficiency*

- Deployed with Off grid + Big size DGs since July'11 (381 DGs )
- Fuel consumption reduce by 8.63% (ongoing)
- $CO_2$ reduction/Year 478 Ton (1310 kg/DG/Year)



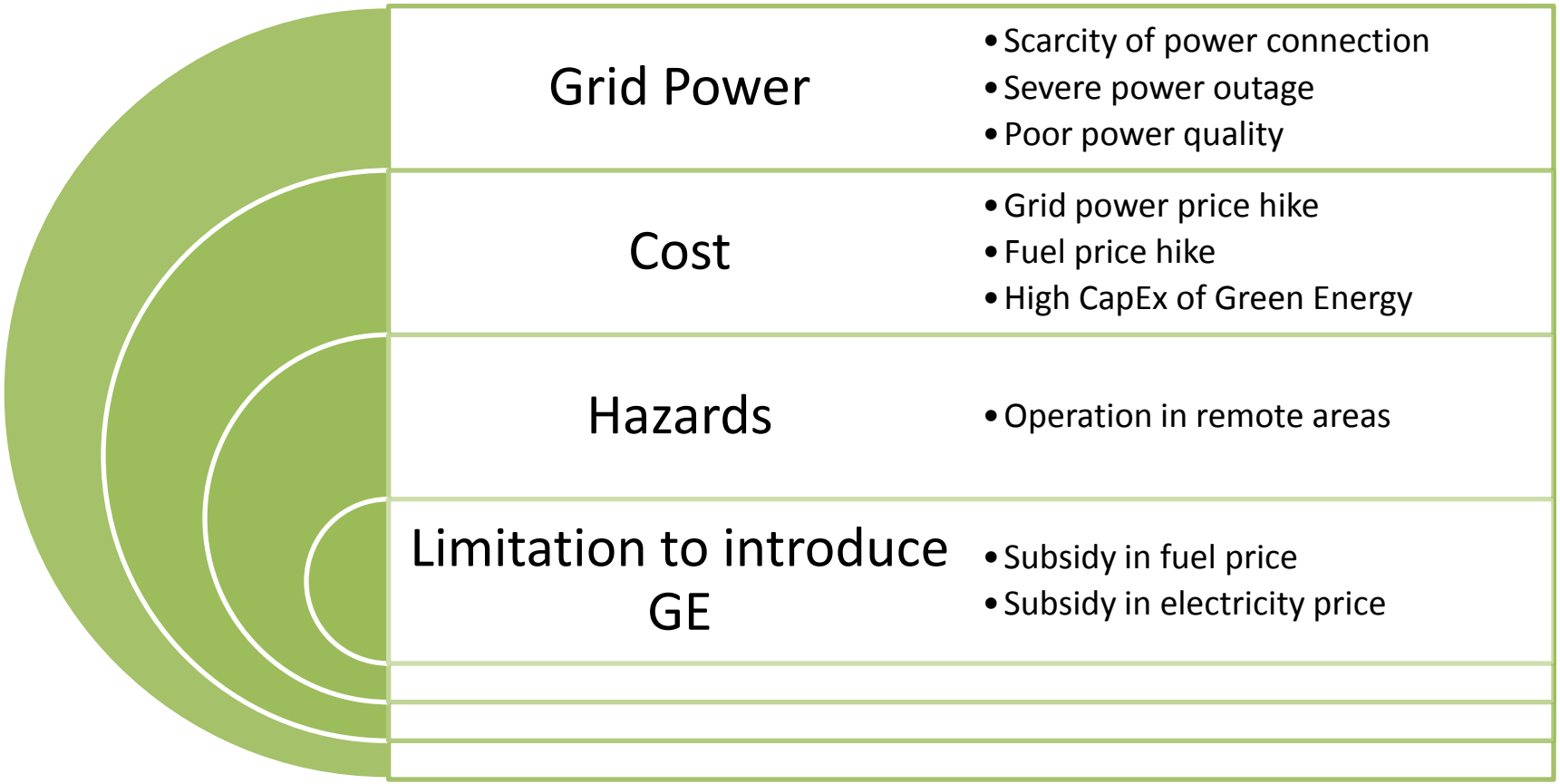



Core Site: Average savings **10.66%**




BTS Site: Average savings **8.63%**

# Challenges with Energy

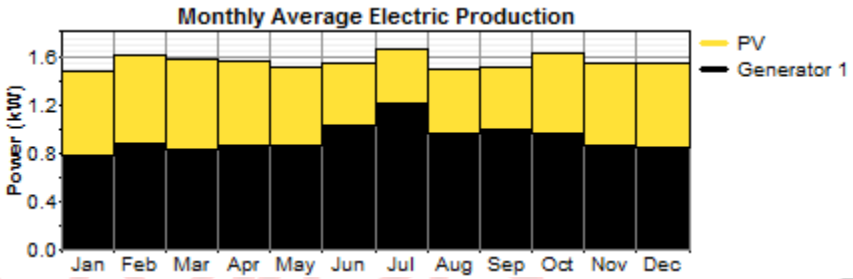


# Initiatives: Low CapEx Solar Hybrid

**System architecture for 1.25 kW Load**

| | | |
|---|---|---|
| PV Array: | 3.2 | kW |
| Generator 1: | 11 | kW |
| Battery: | 800 | AH |
| Rectifier: | 8 | kW |
| Dispatch strategy: | Cycle Charging | |

| Component | Production (kWh/yr) | Fraction |
|---|---|---|
| PV array | 5,527 | 40% |
| Generator 1 | 8,124 | 60% |
| Total | 13,652 | 100% |



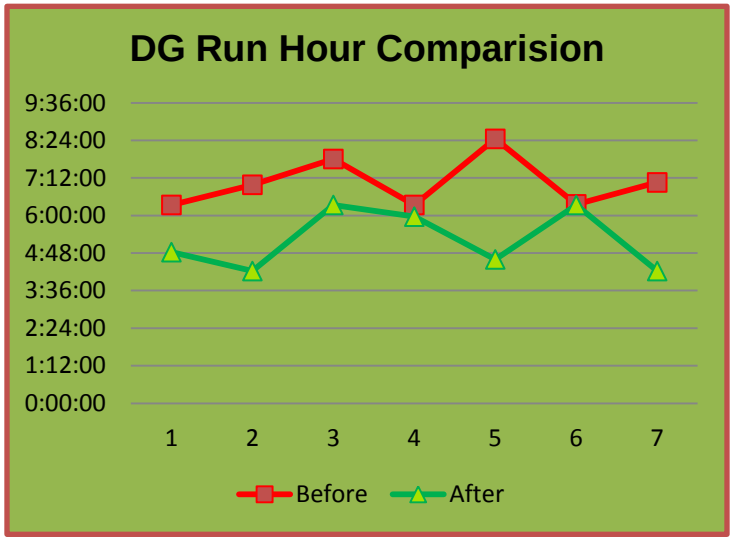

- Downsize PV module – 3.2 kWp
- Avoid space constraint
- Match with CP – NCP Infrastructure CapEx
- Reduce Genset operation at least 2 hours
- Payback within 3 Years

# Initiatives: Quick Charge Battery

Trial Site Details:

| | |
|---|---|
| Site Code: | MYHLG06 |
| Site Name: | Pabiazuri_BL |
| BTS Load: | 20A ( 1KW) |
| Installation Date: | **26th June Y12** |
| Power Status: | **RWP** |
| Site On Air: | **27-Jun-11** |

*All DG Run Hour Data from Daily event report




**Average DG Run Hour per day:**

| | |
|---|---|
| Before REX | **7:02:45 Hr** |
| After REX | **5:12:57 Hr** |

Saving

| Item | | |
|---|---|---|
| Run hour Saving/day | 1.82 | Hr |
| Fuel Saving/Day | 4.00 | Ltr |
| **Cost Saving** | **26%** | |

# Expectations

- Recent BTRC guideline is to implement Green Energy in 5% of total sites

Expectation form regulatory and other Stakeholders

- Priority to allocate Grid Power
- Declare Telecom Battery as a Green Energy Source and reduce taxation

- Recognition of all energy saving initiatives taken so far
- Incorporate CDM collectively
- Interest free/Low cost fund from local or foreign investors
- Introduce latest technology, suppliers, investors and provide low cost & cost effective solution

# Thank You

018

an axiata company

# Expectations

**From Government:**

- Interest free fund for GE deployment
- Ease procedure to get and use international funds for GE deployment
- Reduce and ease regulatory steps and cycles of BTRC and MOPT for importing GE products
- Approve Energy Saving Initiatives taken by MTOs of Bangladesh within their scope
- Declare Solar PV Module, Solar Charge Controller, Solar Battery for Telecom Operation, Wind Turbine and accessories, Hydrogen Fuel Cell and accessories etc. as GE products
- Duty free import of Green Energy Equipment
- Income Tax rebate on investment in Green Energy System
- Provide incentive for GE deployment
- Recognize GE deployment to encourage other industries
- Permit export of used/written off telecom equipment for disposal outside Bangladesh
- Facilitate standard disposal of used telecom equipment
- Facilitate H2 fuel availability at low price to use in H2 fuel cell a GE initiative.
- Introduce E-Billing system for Electricity Bills all over the country. It will reduce site visit for bill checking and bill payment thus reduce usage of fuel and carbon emission.

**From GE Business Organizations:**

- Interest free/Low cost fund for GE deployment
- Incorporate CDM in GE business with Robi
- Introduce latest technology and provide low cost / cost effective solution