

Market Drivers & Best Practices



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Market Drivers – Green Telecom

Energy Costs

Reducing ARPU

Regulatory, Government Subsidies

Facilitated by Technological Evolution in Energy Solutions

Social Obligations

- **Contribute towards greener environment**
- **Economic development of rural areas**
- **Improve overall network availability**



ambient cooling

renewable generation

Challenges – Green Telecom

Energy saving products available but engineering solutions are not

Accountability of products

Remoteness of deployment is a concern

Measurement of actual energy consumption

Pilferage

Cooling

Remote



Site analysis to arrive at best fit

Data Collection: Site and Location

Data Analysis and Creation of Possible Options

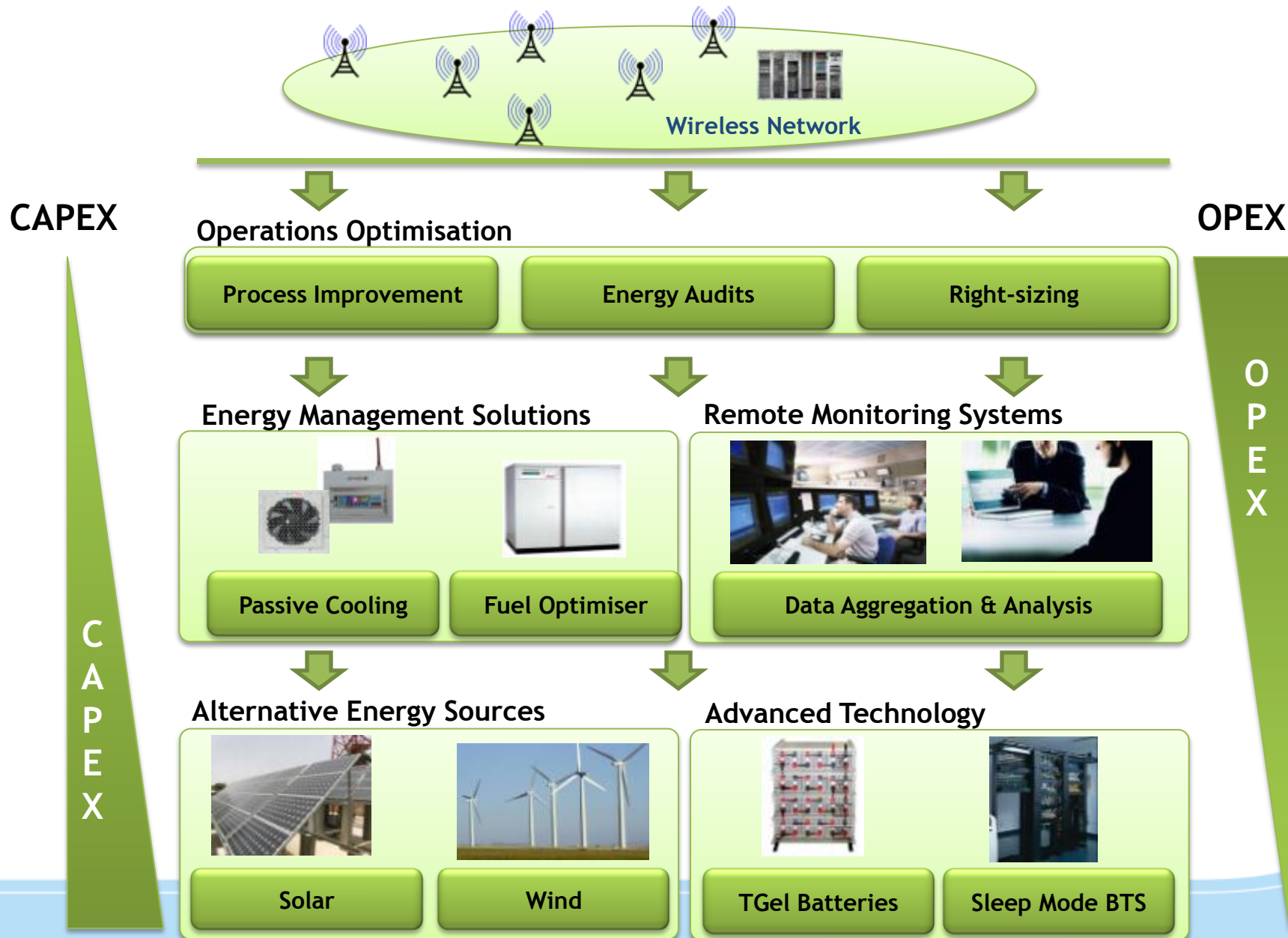
Simulation for Load & power generation Cycle

Selection of Best Fit

Implementation and Performance Monitoring

- Electrical load: Telecom ;Non-Telecom
- Site Location Information: -
- Clutter type: Open / Dense / Partial
 - ❖ Distance from nearest City
 - ❖ Wind flow
 - ❖ Surrounding Area information
- Nearest Gas station and possible logistics aspects
- Electrical Inventory Specifications
- Site lay out (available sq ft area)
- Site Lat long

Capex Gradient Model for Opex reduction



DG - The last Resort



Utilize Solar power during the day. Excess Energy Stored



Utilize Wind Energy where available.



Utilize DG as the last resource



Utilize Renewable Energy when available. Buffer excess energy in Battery

118K Renewable Energy Tower sites can save upto 2.5 Bn Ltrs of Diesel

GSMA Press Release



How Green is Green



Annual
Expected
Carbon
Emission
Reduction Per
Site

GREEN TELL.COM

27 tons

ALL Green - Renewable source of energy (Solar, Wind); Free Cooling; Fuel Optimisation; Voltage correction; 4 Hour full load battery back-up deployed
No DG run or max of 15 hours per month

24 tons

Green - Free Cooling; Fuel Optimisation; Voltage correction; 4 Hour full load battery back-up deployed
DG run-Max 2 hours per day

19 tons

Energy Efficient - Free Cooling; Fuel Optimisation; Voltage correction deployed
DG run max of 4 hours per day

Remote Monitoring System



Trouble Tickets, work updates



OMCR



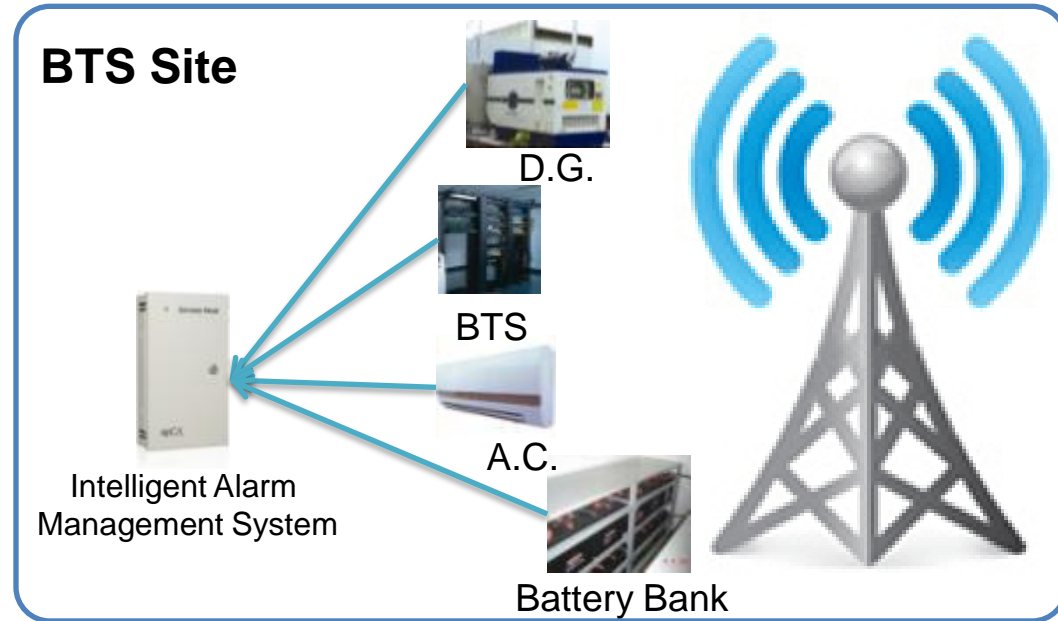
Real time monitoring & Analysis



RMS Servers

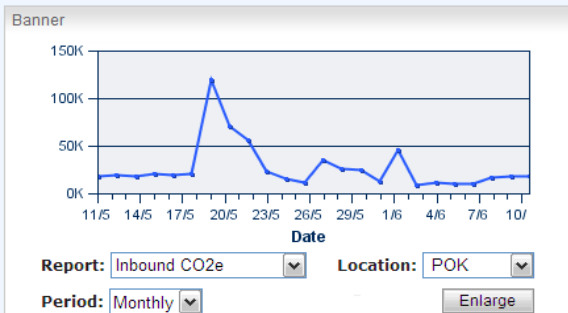
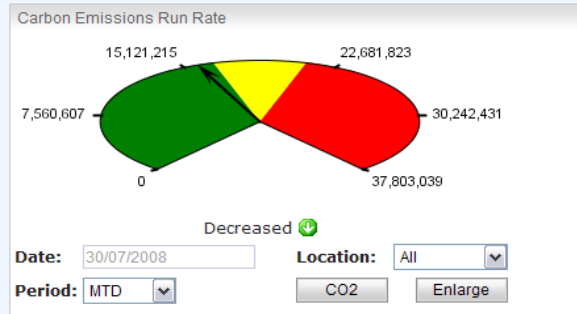
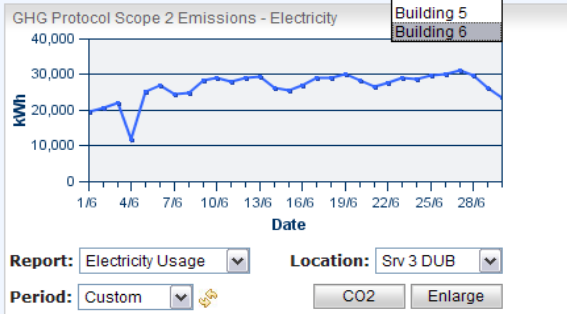
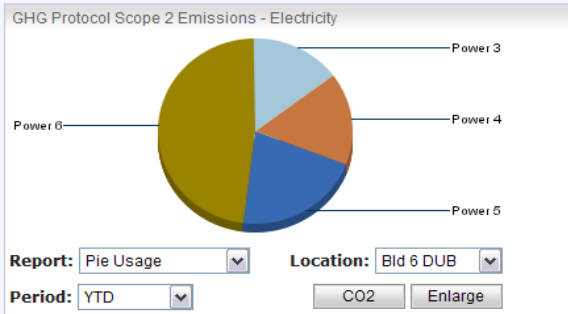
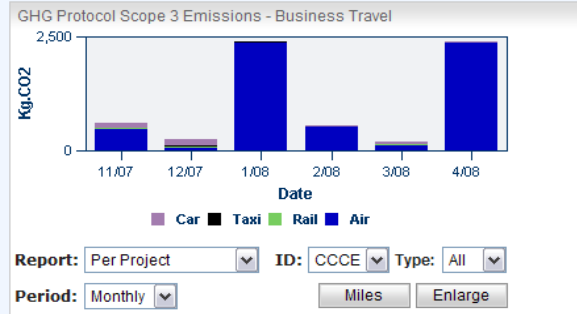
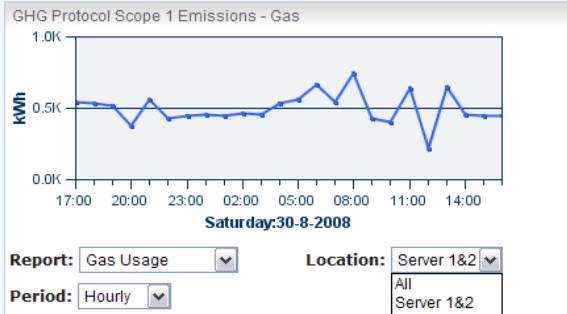
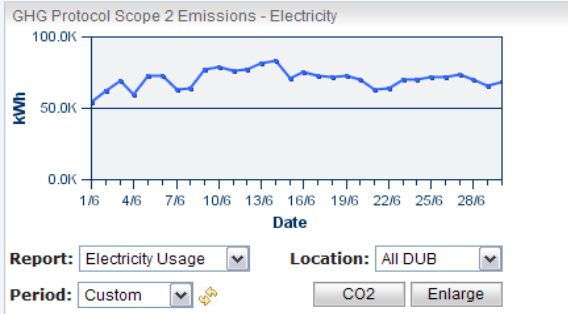


Alarms, Site Data



Remote view from the NoC

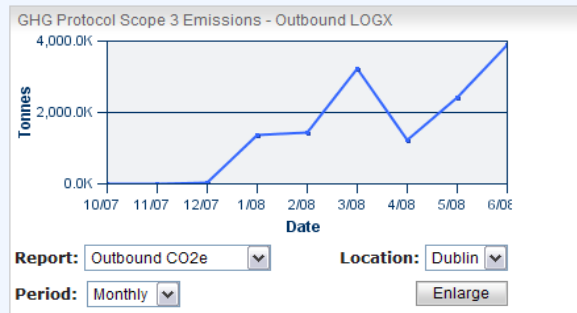
Continuous energy measurement and improvement methodology



Alert Log

Date	Time	Usage	Alert Type
29-08-2008	23:00	445.0	Profile Alert
29-08-2008	23:00	331.0	Profile Alert
29-08-2008	22:00	91.0	Profile Alert
29-08-2008	21:00	559.0	Profile Alert
29-08-2008	21:00	342.0	Profile Alert

Area: Gas Usage Business: ISC Dublin
 Location: All Manage Enlarge



Benefits of Green Tower

Economic: Employment Generation; Returns on Land on lease without environmental degradation

Environmental:

- **Tower Sharing** saves utilization of precious natural resources :
 - 📶 Steel (app 10 tonnes); Cement, Concrete
 - 📶 Galvanization (500 litres of Zinc); Land & Soil conservation
 - 📶 Optimised use of Power: More communication throughput/energy unit consumed
 - 📶 Generation and consumption local- no transmission losses

– Carbon Footprint reduction

Source of Power	Standalone basis	After EMS	% savings
Grid	85 Kwh	68 Kwh	20
Diesel Generator	30 Liters	17 litres	43

- A GBT shared by 2 operators with 12 hours EB and 12 hrs DG running is assumed
- each KWH contributes 0.82 kg of co2 and one liter of Diesel consumption emits 2.8 kg of co2

**Contribute towards
building a greener, cleaner
environment with
reduced carbon emissions**

**Save on OPEX by reducing
power consumption
through energy saving
engineering solutions**

**Ensure uninterrupted
power at the site
increasing total site
availability in the network**

**Increase equipment shelf
life by ensuring healthy
power at the site**

**With growth
comes responsibility**

