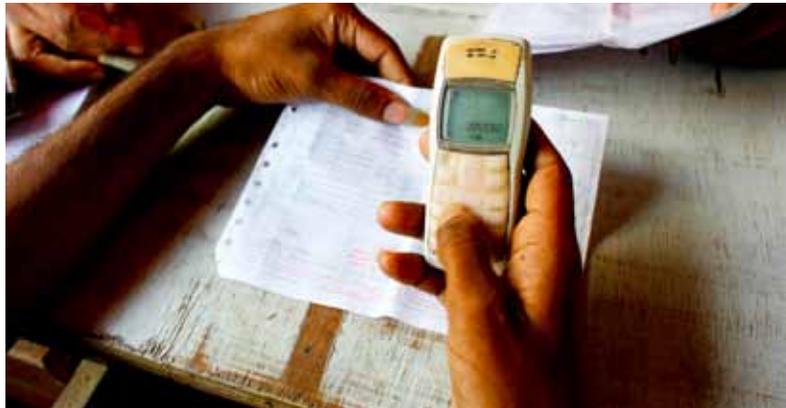


Telecoms Renewable Energy Vendors/ESCOs Landscape in Bangladesh



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Introduction

The Green Power for Mobile (GPM) Programme was launched in 2008 by GSMA to promote the use of renewable energy technology and solutions by telecom Industry. The programme is supported by the International Finance Corporation (IFC) and partners with the Government of the Netherlands.

At the same time government of Bangladesh has driven financial programme to promote green technology in telecom by offering a 15% Value Added Tax exemption for all renewable energy equipment and related raw material as well.

Since mid-2012, the GPM team has led Bangladesh-specific activities and conducted one country-focused working group in Dhaka in October 2012. Bangladesh, with an electrification rate of below 50%, has limited the telecom industry's delivery of power to their base station¹.

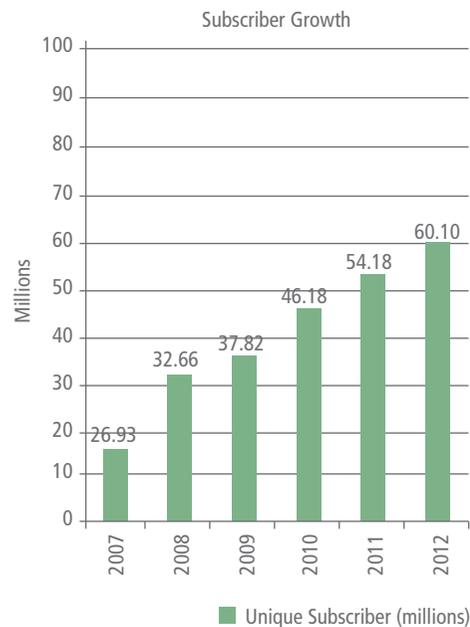
This document presents a summary of the power situation in Bangladesh, listing the main vendors/service providers that operate or have interests in the Bangladeshi telecom market.

Telecom Market

Bangladesh located in the South Asia region, has a population of about 152.51 million people², with total area about 147,570 sq.km³, and is divided into 7 provinces: Dhaka, Chittagong, Khulna, Rajshahi, Sylhet and Rangpur. Dhaka is the capital.

Both GSM and CDMA cellular technology can be found in Bangladesh but GSM predominates the market. There are over 60 million unique subscribers across the country in 2012, with a growth rate of close to 18% (Year on Year)⁴.

Figure 1. Subscriber Growth in Bangladesh



GSMA estimated that, by the 2nd quarter of 2013, there will be more than 63 million unique subscribers⁵. The rural areas will be the next key growth driver for Bangladesh operators, as the rural customer base and mobile coverage expand. The barriers to this expansion are:

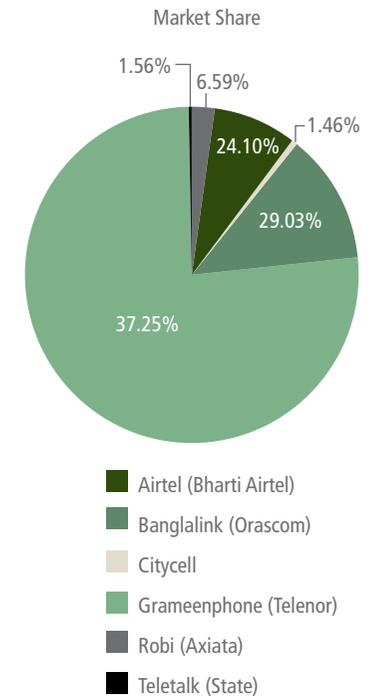
- Poor electricity grid: the electrification ratio in the country is only about 50% and the power cuts are happening every day, in both urban and rural area⁶.
- About 31% of population lives below the poverty threshold and cannot afford to own a mobile phone⁷.

Market Share of Mobile Operators

The top 3 market players are Grameenphone, Robi and Banglalink, holding 90% of market share. The number of connections grew by about 15 million by Q4 2012, representing a 16% annual increase⁸. The government has also

made efforts in the past year to make the market more attractive by releasing new opportunities on 3G licenses for mobile operator.

Figure 2. Mobile Operators Market Share (4Q2012)⁹



2 Bangladesh Bureau of Statistics – www.bbs.gov.bd
 3 Bangladesh Bureau of Statistic (BBS) – www.bbs.gov.bd
 4 Wireless Intelligent
 5 Wireless Intelligent
 6 Power Division – www.powerdivision.gov.bd
 7 World Bank – www.worldbank.org
 8 Wireless Intelligent
 9 Wireless Intelligent

Tower Infrastructure Development

Tower sharing activity has developed in Bangladesh with concept one on one site sharing. The government has emphasis MNOs to share their passive infrastructure according regulation from Bangladesh Telecommunication Regulatory Commission No. BTRC/LL/INF-SHARING (304)/2008-1108. And the tower owner can reserve not more than 25% space for their own purpose.

Until this RFI completed, Tower Company is starting in early stage of development and discussion. It will build new business concept for Bangladesh market.

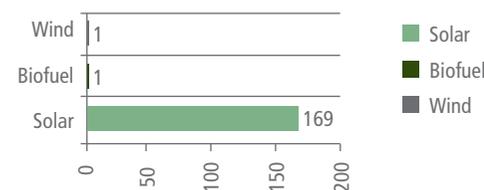
Powering up Telecom in Bangladesh

Powering up telecom becomes main challenges in Bangladesh where the power outage happens at least 4 hours a day for city area and 8 hours a day for rural area¹⁰. To minimize deficit of power, the government has set a target to mobile operator to convert 5% of tower sites to renewable solutions by 2015¹¹.

In current deployment, MNO has taken a lot of initiatives in reducing dependency on fossil energy by implementing DG battery hybrid solution. GSMA identifies around 3,340 out of 25,858 tower sites converted to DG battery hybrid solution by optimizing battery life cycle on site¹².

Renewably energy has been deployed in Bangladesh for telecom sector. The deployment of green technology shows in Figure 3. Less than 1% or 171 tower sites are converted in green technology and solar solution is preferred green technology for operator in Bangladesh.

Figure 3. Green Power Deployment¹³



Business Model Development

In powering telecom network, MNO is offered by multiple concepts from Bangladesh's vendors. Some vendors offer CAPEX business model and the others offer OPEX business model for either energy efficiency or green technology solution.

The business model has moving to transition mode from CAPEX offered solution toward OPEX scheme solution. The CAPEX business model is the common practice where vendor will sell their green technology product to operators, whereas the OPEX will offer pay-per-use method for operators. On CAPEX model, operator needs to spend their capital to buy green solution to power up the base station. Different with OPEX model, TCO will be handled by vendor and operator just needs to pay per kWh based on power purchase agreement (PPA).

PPA model has been implemented in almost operators in the country. OPEX model has been implemented for both energy efficiency and green solution and it is still looking the shape to meet demand requirement toward massive deployment in Bangladesh.

Vendor/ESCO Landscape

GSMA is listing the main vendors/ESCOs who are active or have an interest in the Bangladesh market. This list is composed of energy vendors/ESCOs' company profiles, their footprint and testimonies, as well as local and international companies.

Table 1. Bangladesh Renewable Energy Vendor/ESCO Listing

Company	Core Competencies
Emergence Bioenergy	Biogas
Heliocentris	Energy Management
Northstar Battery	Energy Storage
Ballard Power Systems	Fuel Cell
Eltek Power	Power Equipment
Bangla Trac Miaki Green Power	Power Solution Provider
NextGen	Biogas
Applied Solar	Solar
Electro	Solar
Engreen	Solar
InGen Technology	Solar
Rahimafrooz	Solar
Ericsson	Telecom Equipment
Huawei	Telecom Equipment
ZTE	Telecom Equipment
South West Wind	Wind Turbine

10 GSMA GPM Research
 11 Power Division – www.powerdivision.gov.bd
 12 GSMA GPM Research
 13 GSMA GPM Research

Applied Solar Technologies (AST)

Company Background

Applied Solar Technologies (“AST”) is green and renewable power solution company in India. During last three years of operations in India AST has acquired expertise to design, deploy and operate green energy solution based on solar PV and HFC for variety of off grid applications in telecom, oil, banking and community power sector.

Client list

Bharti Infratel
Indus Tower
Idea

“Applied Solar Technologies India Pvt Ltd. (AST) introduced its ‘Hybrid Solar Power Systems’ in India in August 2009. Concept of solar solution at tower site was conceptualised by Infratel and Solar DG hybrid model was co-developed by Infratel & AST and it was 1st implemented at 500 Infratel sites in Bihar (India) by AST. After successful implementation, this model was accepted by the entire telecom tower industry in Bihar, UP East and UP West states.

Bharti Infratel



AST has deployed solar PV panels of more than 10MWp. AST provides off grid solar power currently to telecom towers which often rely on diesel based generation for 50 – 100% of their power requirements. AST builds and operates these solar installations and takes over the power supply management of each site. It uses a combination of solar PV, battery back-up and diesel generator making it a hybrid energy solution that optimizes the usage of various sources through a controller. The optimal usage of these sources results in decreased diesel consumption, increased battery life and reduced diesel generator maintenance and replacement costs resulting in savings for AST’s consumers.

Product and services

We offer a complete range of services covering energy survey, solution design, supply, installation and power supply management for renewable hybrid energy systems based on solar PV and HFC for telecom towers, community power, petrol stations / GAS stations and bank ATMs.

Our solutions offer superior remote monitoring functionality for efficient system control with our proprietary network management system providing solution performance information, data logging and alarm management.

Scale/maturity of enterprise

- AST has installed and is managing solar hybrid passive power infrastructure at more than 2100 telecom towers, Gas stations and Bank ATMs.
- AST completed successful pilots of HFC on telecom tower sites and is readying for commercial deployment.

Geographic footprint

Currently in India – Bihar, UPE, UPW and MP states. Plan to expand to Africa and ASEAN countries.

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Ballard Power Systems

Company Background

Headquartered in Burnaby, British Columbia, Ballard Power Systems Inc. (TSX: BLD; NASDAQ: BLDP) provides clean energy fuel cell products enabling optimized power solutions for a range of applications. We are recognized as the world leader in design, development and manufacture of zero-emission proton exchange membrane (PEM) fuel cells and are focused on accelerating commercial adoption. Ballard's products and solutions deliver tangible improvements over incumbent technologies across a range of stationary power and motive power applications.



Ballard ElectraGen™- ME Fuel Cell System for Backup Power



In addition to delivering improved business results for system integrators, OEMs and end-users alike, our fuel cell products afford major environmental benefits. With our proven technology, comprehensive range of fuel cell products and services, unsurpassed field experience and teams of highly-skilled people we have what it takes to create smarter solutions for a clean energy future.

Product and services

For telecom service providers, power outages can be devastating. Fuel cell backup power solutions for telecom offer numerous compelling advantages over conventional lead-acid battery and diesel generators in backup power applications.

Ballard offers a comprehensive portfolio of backup power systems, scalable from 2kW and up, to meet a range of application requirements. Ballard's fuel cell systems for

backup power are designed for high reliability, long life, minimal maintenance and provide extended runtime at an attractive lifecycle cost.

The ElectraGen™ family of fuel cell power generation systems, fuelled by either methanol or compressed hydrogen, provides backup power for both 'short duration runtime' and 'extended duration runtime' requirements. Ballard's ElectraGen™ systems offer proven financial and environmental advantages in comparison to lead acid batteries and diesel generators.

Ballard and our global network of partners provide complete, proven solutions that can be implemented rapidly and easily, providing end-to-end support for a range of application requirements.

Geographic footprint

North America, Europe, Africa, India, China, Indonesia, Japan, and Australia.

Client list

China Mobile	Nokia Siemens Networks	PT Hutchison	Vodacom
Idea Cellular	Orange	CP Telecommunications	Wind Mobile
Motorola	SINE Network	Telstra	

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"Integrating fuel cells with our base stations can significantly increase the resilience of the mobile networks we provide."

Nokia Siemens Networks

BGMP

Company Background

Bangla Trac Miaki Green Power Limited (BMGP), an exclusive partner of NorthStar Battery Limited USA, is a leading Power Solution Provider in Bangladesh. BMGP provides innovative energy efficient hybrid power solutions for the telecommunications industry. Since 2010, it has taken operations and maintenance ownership of more than 100 sites for three leading mobile operators.

Bangla Trac Ltd (BTL), BMGP's mother activity, has been successfully operating its business since 2004 with the sole distribution authority of Caterpillar Inc. USA products.



BTL has specialized in Power Engineering, Power Plant, Telecommunication and Commercial sectors. The group has almost 2,000 employees.

BMGP has not only added positive value to the local and international brands but also contributed to the group with a remarkable footprint in the gigantic telecommunication sector with an ultimate expertise in Engineering, Project Management, Battery, Renewable Energy and Energy Audit and finally Commercial expertise.

Product and services

Power Management: Bangla Trac Miaki Green Power combines state of the art technologies with local knowledge to OPTIMIZE power consumption in the telecom sector. BMGP focuses on optimizing OPEX Power expenditures and guarantees a SLA through which customers can control their power expenditure and guarantee its availability.

NorthStar Battery: NorthStar batteries are designed and manufactured with premium

materials and technology to withstand extended operating temperatures up to 65°C. It also facilitates dual venting port for easy installation and optimum gas evacuation.

SiteStar Cabinet: SiteStar™ cabinets are designed for both indoor and outdoor environments, with a combination of low thermal conductive materials and a high-efficiency climate solution. We keep batteries at optimal operating temperatures thanks to a cost-effective cooling technology and cabinet shells that allow power savings up to up to 95% higher than air-conditioned cabinets.

Heliocentris Energy Manager: Heliocentris develops innovative energy management solutions primarily for the mobile industry. Its solutions help operators lower their OPEX by reducing diesel consumption and generator maintenance.

Geographic footprint

Bangladesh.

Client list

ICOM Data Center
Orascom BD Ltd
Axiata BD Ltd
Grameen Phone Ltd (Telenor)

Global Partners

Heliocentris
Olympian
Northstar
Caterpillar

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EBI

Company Background

Emergence BioEnergy Inc. (EBI) is a US-based company developing remote power solutions in emerging markets. EBI is currently piloting a low-maintenance, primary power generation system in Bangladesh operating from biogas and other fuels, including diesel, natural gas or any hydro-carbon-based fuel. EBI developed a model for distributed generation that can provide continuous, reliable power for telecom towers, while empowering local farmers in remote areas by creating revenue streams from waste.



The EBI approach addresses a number of key issues facing telecom tower operators including reliability, fuel logistics, community relationships and long-term sustainability. EBI is headed by Iqbal Qadir, the founder of Grameenphone. Our first pilot site is in operating in Bangladesh since 2012, with commercial operations beginning in early 2014.

Product and services

The EBI product is based on Stirling micro-CHP technology that is uniquely suited for mission critical remote power needs:

Fuel Flexibility/Primary Power: The solution can run 24*7 continuously without the need of a backup power from any hydro-carbon fuel including renewables like biogas or biofuels in addition to traditional fuels like diesel or natural gas. The engine can also switch between fuels without any intervention.

Heat Recovery: The micro-CHP can recover heat produced during power generation, cycling this heat into a secondary cooling process that can provide air-conditioning without the using electricity.

High Operational efficiency: 70,000 hours (10 year) operational life, less than 20% maintenance costs of diesel generators, increased battery life and fewer site visits results in dramatically reduced costs.

Low noise: Engine noise levels do not exceed 65 dBA, which means it can operate in remote villages without disturbing the environment.

Geographic footprint

Bangladesh, India, Pakistan.

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Electro Solar Power Limited

Company Background

Electro Solar Power Limited, Bangladesh's first PV panel assembling plant, started its journey in the field of solar energy and was officially registered in 2010 as an independent company within the Electro Group. Since 2010 Electro Solar has been involved in a large number of project developments for solar power plants and solar pump system countrywide.



Today Electro Solar is the country's leading independent engineering company for solar power plants and solar pump systems and has provided engineering services for many solar power plant projects and several solar pump projects throughout the country.

Products

- Solar PV Module / Panel
- FLA and VRLA Battery
- Solar MPPT Charge Controller
- Solar Grid-Tie Inverter
- Off-Grid / Backup Inverter
- Solar Pump System
- Solar Auto Tracker for PV Module

Services

- Turnkey Solution for Solar Mini-Grid
- Turnkey Solution of Solar Pump System
- Turnkey Solution of Solar Power for BTS
- System Design and Consultancy
- Solar PV system Supply and Installation

Geographic footprint

Bangladesh (Dhaka, Gazipur, Savar, Faridpur, Chittagong, Sandwip, Bandarban, Rangpur, Bogra, Thakurgaon, Mymensingh, Sylhet, Comilla, Khulna, Barisal).

Client list

Grameenphone Limited
Pacific Bangladesh Telecom Limited
Axiata Company Limited
ORASCOM Telecom Bangladesh Ltd
Augere Wireless Broadband Bangladesh Ltd

Partners

SMA Solar Technology AG, Germany
Studer Innotec, Switzerland
Shenzhen Solartech Renewable Energy, China

Company

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9892658, 989277

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Eltek

Company Background

Eltek has a long history of more than 40 years of experience as a leading global provider of highly efficient Telecom Power Solutions. Eltek has a strong global position with more than 2,200 employees worldwide, offices in 30 countries and business activities in more than 100 countries.

Client list

Airtel	France telecom	Qtel	Vodafone
Bangalink	Millicom	Safaicom	Viettel
Citycell	MTN	Singtel	Warid
China Telecom	Orange	Telsonia	
Etisalat	Orascom	Telenor	

“Eltek collaborates with Vodafone on more than 30-0 sites of ‘hybrid’ functionality along with Eltek’s Smartpack controller. The overall system has shown an outstanding stability, reliability and significant OPEX savings.”

Vodafone – Greece



This gives us a unique capability to serve global customers. At the same time, our companies around the world are firmly rooted in the local business environment to better serve our customers locally.

Technology leadership has always been a cornerstone of our strategy and a major reason for our success and Eltek devotes much of its R&D efforts to the development of new state-of-the-art designs. High power-density, flexible and cost efficient rectifiers and converters form the core of the company’s offering, including Eltek’s High Efficiency product line designed to help the Telecom industry reduce its energy usage and environmental impact.

Product and services

Eltek offers hybrid solutions that enable communication even in the most rural areas with the Flatpack 2 HE (High Efficiency) rectifier. To date, more than 500,000 units have been installed, demonstrating impressive field performance with up to 96.5% efficiency.

With our new Eltek Cooling Box (ECB), an air cooling system with optimized thermal system controller and efficient fan and filter solution, operators can now achieve up to 85% energy savings. Eltek’s hybrid power solutions are based on HE technology to maximize the energy out of each drop of diesel, every square inch of the solar panels or the smallest gust of wind to offer customers a unique opportunity to save energy, money and the environment. We bring to you our total product offering including the latest Battery technologies, after sales and maintenance support locally with in Bangladesh.

Geographical footprint

Global, Regional and Local in Bangladesh.

Company

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(Branch office)
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Flat-F, Gulshan-2,
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Engreen

Company Background

Engreen Ltd. (A sister concern of Concord Pragatee Consortium Ltd). Established in 1982, Concord Pragatee Consortium Ltd. (CPCL) has achieved several accolades for successfully completing a wide range of multi-million dollar projects in the Construction Industry, in particular those related to Power Generation, Highways, Bridges etc.



CPCL spread its wings into green energy arena in 2012 by forming a dedicated venture called 'Engreen Limited' with its "Nurture Nature's Power" Mission mitigating the challenges of going green. Engreen is currently one of the leading ESCOs of Bangladesh, working towards the creation of optimized green power solutions for mobile base stations. Despite many failed cases of other ESCOs in Bangladesh, Engreen has been successful in enabling mobile beyond the grid through introducing cost-efficient renewable energy technologies in GF/GFRT/RT off-grid sites of the MNOs through Power Purchase Agreements (PPAs).

Product and services

- Facilitates MNOs to extend their footprint in off-grid areas by providing load wise customized Solar-DG Hybrid system with 100% power availability.
- Owns, installs, operates and maintains the renewable energy power system and sells power to the MNO at an agreed per kilowatt-hour rate.

- Minimizes MNO's OPEX though reducing DG Run Hour and also save environment through the reduction of CO2 Emission.
- Provide customized solution to fit the existing tower sites with required shadow-free and sun facing space.
- Solar-DG Hybrid system includes: 4 to 8kWp PV, maintenance-free Gel battery with cooling units, 80 to 160A controller and 15 to 25 KVA DG at an average run of 1 to 2hrs per day.
- Real-time Monitor and Control Unit includes: site performance data, fault alarms, energy meter, diesel fuel meter, battery & DG usage reports both for individual sites and entire network of the last mile.

Geographical footprint

All regions of Bangladesh.

Client list

Banglalink (A subsidiary of Orascom Telecom Holdings in Egypt)

Company

House: 13/5, Block A,
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Ericsson

Company Background

Ericsson is a world-leading provider of telecommunications equipment and services to mobile and fixed network operators. Over 1,000 networks in more than 180 countries use Ericsson's network equipment, and more than 40% of the world's mobile traffic passes through Ericsson networks. Ericsson is one of the few companies worldwide that can offer end-to-end solutions for all major mobile communication standards.

Client list

Worldwide

"For every site where we have made Ericsson recommended changes, we can reduce power consumption by between 22% and 30%."

Mike Wright, Executive Director of Networks, Telstra



Energy efficient portfolio

We offer a variety of energy-efficient products, solutions and services to help our customers reduce their environmental impact and also reduce the footprint of our own activities. Ericsson's solutions on node, site and network level are helping to minimize the power consumption while maximizing traffic. By drawing upon Ericsson's global consulting and technical capabilities, we can assist operators in every stage of the project, from initial baseline analysis through to implementation and final reporting and measurement of solutions deployed.

Products

- Energy Efficient Radio Technology
- Site Power & Cooling Equipment
- Alternative Energy Sources
- Power Saving Features
- Remote Site Management
- Automated Network Power Management
- Energy Efficient Network Layer

Professional services

- Environmental Consulting
- Energy Assessment & Optimization
- Active & Passive Energy Management
- Lifecycle Assessment
- Data Center Efficiency
- Managed Rural Coverage
- Smart Energy Management

We work with efficient materials management to avoid hazardous substances and use resources more effectively and reduce environmental impact of manufacturing, use and end-of-life treatment. We offer free take back of decommissioned equipment in all the countries in which we operate

Geographic footprint

Worldwide.

Company

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Website

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Heliocentris Industry GmbH

Company Background

Heliocentris. Multi-Hybrid Energy Solutions for Telecom.

Heliocentris is specialized in autonomous energy supply and energy efficiency solutions with the aim of replacing diesel generators with "zero-emission" products.

The company, which was founded in Berlin in 1995, develops and markets innovative and sustainable systems in power and energy generation as well as turnkey solutions for customers in industry and the academic field.

Client list

du (Emirates Integrated Telecommunications Company)
Telesite Ltd (Mozambique)
Telecel (Zimbabwe)
HCPT/Hutchison (Indonesia)

"Heliocentris is the only supplier to meet and even overachieve contractual performance requirements."

(CTO HCPT Indonesia).



Solutions

Heliocentris provides Energy Management and Clean Energy Solutions for wireless networks at off-/bad- and on-grid locations. Services throughout the life cycle guarantee a customer oriented and optimized offering.

Energy Management Systems

The Energy Manager with its modular architecture, proprietary software, sensors, control modules and a Remote Management Server Platform - is specially designed to manage and protect telecommunication sites. Remote monitoring and control solutions provide transparency, increase site availability and security and reduce costs.

Clean Energy Solutions

The Genset Efficiency Solution including an intelligent energy management optimizes the operation of diesel generators on site. Installations of the Heliocentris technology achieved over 50% fuel savings and 75% generator runtime reduction.

Furthermore, innovative and renewable energy concepts including PV, wind generators and Fuel- Cell Solutions are key competences of Heliocentris.

Services

Heliocentris offers a set of Professional Services ranging from Energy Consultancy, Energy Audits, Planning, Energy Design & Engineering, Implementation, Project Management and Technical Support.

Geographic footprint

Europe, Middle East, Africa, Asia Pacific and Americas.

Company

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Huawei Hybrid Power – PowerCube

Company Background

Based on the professional accumulation of ICT network over 20 years, Huawei launches PowerCube: the innovative hybrid power solution for telecommunication sites.

PowerCube focuses on saving energy and reducing OPEX through maximally improving energy transferring efficiency. Over 22,000 PowerCube have been deployed all over the world, serving more than 85 operators in 80 countries, including MTN, Zain, Airtel, Vimpelcom, Vodafone and so on.



Product

PowerCube is a new generation hybrid power system. With the newest energy controlling and transferring technology, it makes full use of energy sources such as solar, diesel and grid. Diesel hybrid, grid hybrid and solar hybrid series can be selected to meet different scenarios.

The core concept of PowerCube is "Saving, Single, Smart".

Key Characters:

- Saving: fuel 40%-60%, footprint 30%-70%, maintenance up to 90%
- Single: single platform, modular design, smooth expansion & evolution
- Smart: intelligent NetEco system achieves highly efficient operation & maintenance management

PowerCube realizes the maximally saving for customers by using Bit Managing Watt

Technology to achieve high efficiency of energy conversion and utilization.

As for solar hybrid solution, SolarMax technology achieves high tracking accuracy, high sensation of light, high conversion efficiency and high temperature adaptability. As for diesel hybrid solution, DieselMax technology improves efficiency in each procedure of energy flow from end to end. As for grid hybrid solution, GridMax technology maximizes using grid with fast chargeable energy storage system.

Through advanced operation support system – NetEco, PowerCube helps the operators greatly improve energy management efficiency for reducing OPEX.

Geographic footprint

Worldwide.

ICT network energy efficiency specialist
Reliable partner for customer

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InGen

Company Background

INGEN Technology Limited was formed in November 2007 as a branch of TechValley, an established company since 1990. InGen Technology Limited focusses on Renewable energy (Solar Energy) & Back-up Power (IPS, UPS & Data Centre). In the Solar Energy sector, InGen has already installed over 4,500 Solar Home Systems (SHS) in the rural areas with its own investment and has enlisted as a PO (Partner Organization) with IDCOL.



With a view to develop solar energy in Bangladesh, InGen has already partnered with some of the world's highly ranked companies like EverExceed, Canadian Solar, Advance Solar Photonics for Solar panels and accessories. In the IPS/UPS market InGen is representing APC (American Power Conversion), a world reputed company in power sector. InGen believes on customer satisfaction through our commitment and product excellence.

Product and services

- Telecommunication
- Rural Solar Home System
- Water Pump
- Medical Refrigerator
- Computer Solution
- Navigation
- Street Light & Bill Board
- Water Heater
- Lantern
- Signaling
- Building Integrated Photovoltaic Solar IPS.

Company milestone

1. GrameenPhone:-Around 72 BTS goes under Solar Powered Site.
2. Airtel – Around 20 BTS under solar powered site.
3. Banglalink – 1 BTS pilot project in Rajshahi.
4. Robi:-Around 10 BTS under Solar Powered Site.
5. Teletalk:- 1 BTS in Shuvolong, Rangamati.
6. Bangladesh Computer Council – Around 900 union E-Center has been brought under solar power.
7. Bangladesh Bureau of Statistics – Largest On Grid Solar Power plant in Bangladesh (201KWp).
8. Installed over 10000 Solar Home System (SHS) in the rural off grid area.
9. Hi-Tech Park Bangladesh (50Kwp).
10. Supplied over 10000 PV modules & over 4000 SHS Packages to PO's of IDCOL.

Geographical footprint

Bangladesh.

Client list

GrameenPhone Ltd.
Airtel Bangladesh Ltd.
Orascom Telecom Bangladesh Ltd. (Banglalink)
Teletalk Bangladesh Ltd.
Robi Axiata Limited

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NextGen

Company Background

NextGen was incubated at NSRCEL, IIM Bangalore in 2009. NextGen operates in two domains of waste to energy and emission management and sustainability. It is led by a young and passionate team from the best universities in India including IITS, IIMs and BITS-Pilan. It's long term goal is the create sustainable development through technological and social innovations.



Some of NextGen's achievements in the past few years include

- Selected as one of India's most promising cleantech startups by CII (Confederation of Indian Industries) and WRI (World Resources Institute)
- Selected by Business Today as one of India's Most Promising Startups for 2011

Product and services

NextGen has developed an in house biogas technology for decentralized organic waste to energy application, focusing on urban needs of reliability, hygiene and aesthetic values. The biogas plant can be designed to process waste right from 25kgs/day to more than 50tons/day. The plant can take in variety of inputs right from food waste to garden waste to human waste.



The gas so generated can be either used to substitute LPG or can be used to produce electricity. NextGen also works with organizations to estimate, analyze and reduce their carbon and water footprints. Some of NextGen's prestigious clients in this space include Reserve Bank of India, Intel, MNRE, ICICI Bank, Tetra Pak, Pidilite Industries, Rane Industries, United Breweries, Infosys amongst others.

Geographic footprint

NextGen has offices in Bangalore, Mumbai and New Delhi. NextGen has expanded its operations to Sri Lanka, Maldives and Hong Kong.

Company

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Web

nextgenpms.com

NorthStar Battery

Company Background

Established in 2000, NorthStar designs and manufactures premium, high performance lead-acid batteries and energy-saving battery cabinets. NorthStar products deliver longer battery life and a reduced environmental impact, at a lower total cost of ownership. Truly a global company, NorthStar has state-of-the-art facilities in the USA, Sweden, China and India, with products used in more than 120 countries worldwide.



All NorthStar high performance batteries are proudly manufactured in the USA, using the latest automated robotics technology and environmental control systems, to deliver the best consistency and reliability in the battery industry. NorthStar battery cabinets are designed and manufactured in Sweden on a fully automated production line, ensuring a low thermal conductivity, maintenance free design.

Product and services

NorthStar's premium telecom products include the SiteStar™ Cabinet, which is the world's most efficient battery cooling system, as well as a range of high performance long life AGM batteries. OPzV batteries are also available.

The SiteStar™ Cabinet uses active compressors and advanced airflow, ensuring optimal battery operating temperature and extended life. SiteStar™ Cabinets have ingress protection class IP55, with CE and UL approval, and a range of optional kits.

The NSB *Blue + battery* is a high-cycling battery developed for use in areas having unstable power grid conditions. It has been extensively deployed in Indonesia, Bangladesh and in African countries. It is a true uPSOC (uncontrolled partial state of charge) battery, discharge cycles may be started without the battery being fully charged without adverse effect on life. It is suitable for UPS applications.

The NSB *Red battery* uses pure lead grid developed to provide exceptionally long float life at elevated temperatures under stable AC power grid conditions.

The NSB *Yellow battery* is a high quality battery designed to compete with products manufactured in Asia.

NorthStar batteries have an impressive operating temperature range of -40°C to 65°C because of their innovative design and PPO (high modulus polyphenylene oxide) cases.

Geographic footprint

Worldwide.

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Rahimafrooz Renewable Energy

Company Background

Rahimafrooz Renewable Energy Ltd. (RREL) is a Rahimafrooz Group Company, working in the field of Renewable Energy Solutions in Bangladesh since 1985.

Rahimafrooz Solar is a leading integrator, one-stop system solution provider and solar PV component manufacturer in South Asia.

The company offers renewable green energy based on-grid and off-grid solutions to residential/commercial buildings, telecom, irrigation pumps and mini-grids aiming to provide clean energy for all.



With a vision of reducing GHG emissions in Bangladesh, RREL has its own Carbon Project Development Service provider – Bangladesh Carbon.

RREL is committed to cope with changing global demand in order to develop telecom power solutions based on alternate and renewable energy mix. The Standalone as well as Hybrid Renewable Energy Solutions designed by Rahimafrooz are cost efficient and purposely engineered for energy optimization to support remote or semi urban On-grid/Off-grid/Semi Off-grid BTS with continuous power supply where commercial power is unstable or scarcely available.

Product and Services

- System and Solutions
- Solar Home Systems
- Solar Roof-top System
- Solar Irrigation System
- Customized Solar Solution
- Standalone Solar Solution for BTS

- Solar /Diesel Hybrid Solution for BTS
- Grid-tie Solution for On-grid Application
- Mini-grid Solution for Urban Application
- Solar Street Light Solution

Product and components

- Solar PV Module from 20Wp to 300Wp
- 2V AGM/Flooded Batteries Up To 3000AH
- Other Solar PV Components

Services

- CDM Project Development
- Power Rental Service(PPA)
- Project Management
- Annual Maintenance Contract (AMC)

Geographic footprint

Bangladesh, Pakistan, Central Africa, Sudan, Kenya, Ethiopia, Rwanda, Uganda.

Client list

Telecom
Grameenphone Ltd., Bangladesh
Robi Axiata Ltd., Bangladesh
Orascom Telecom Bangladesh Ltd.
LM Ericsson, Bangladesh
Eltek Power Pte.

Company

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Southwest Windpower

Company Background

Southwest Windpower offers the expertise, renewable energy technology, and products to meet global demand for distributed energy solutions worldwide. Whether as stand alone wind turbines, or combined with PV technology, our systems are proven to meet the challenges of today's demanding energy landscape. Twenty-five years of industry leadership, independently tested products, and a proven track record uniquely position our company as the small wind industry standard to meet a variety of power requirements.



The company has built and shipped more than 180,000 wind turbines to over 120 countries worldwide and has sales representation in more than 88 countries. These on-site systems provide energy where it matters: micro-grids for remote villages, telecom towers, remote monitoring applications, homes and businesses, boats, and other remote industrial sites worldwide.

Product and services

The robust and versatile Skystream 3.7 provides scalable energy across diverse sectors, equipped with patented, refined technology and a proven track record. Developed jointly with the U.S. Dept. of Energy, the award winning and internationally certified Skystream 3.7 delivers energy efficiently and reliably in a wide range of wind speeds. With more than 8,500 Skystream 3.7's units installed worldwide, it has proven its reliability by delivering on-site power to any telecom installation.

- Integrates with other onsite energy sources for redundant supply
- Multiple units scale up to meet diverse load requirements
- On/off-grid energy for maximum versatility
- Compact design allows for mounting on communication towers or within limited land areas
- International certifications ensure safe, reliable operation and permit rapid market entry

Our proven wind turbine technology can integrate directly into or beside communication towers, powering critical telecom and broadcast equipment (antennas, transceivers/radios, lighting, etc.), without vibration or interference.

Geographic footprint

Over 120 countries worldwide, including India & surrounding territories.

Company

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ZTE

Company Background

ZTE setup a R&D department of telecom power products in 1995, since the day it was set up the team has gained rapid development with its in-depth understanding on telecommunication technology and become one of the biggest and strongest research team in China telecom power supply industry. There are about 1,200 employees working for ZTE power supply product line now, over 500 are working in the R&D department and 80% of them are with degree of master or above.



Every year, ZTE power invests over 10% total revenue into R&D, with the dedication and innovations spirit to the research and development of new technologies, ZTE Power has obtained more than 192 national patents in power, electricity and electronics, 85% of which are invention patents.

ZTE power has a comprehensive portfolio that includes custom telecom AC and DC power supply system, back-up power products, UPS, green energy solutions and various power enclosures / accessories. ZTE power has 10 years experience on renewable energy solution including solar, wind, hybrid solutions. The "Energy Matrix" design system has been playing a very effective way to plan and deploy the renewable energy sites.

Product and services

ZTE provide two types green energy solution. One is integrated household solar power solution. The other is micro-grid solar hybrid power solution.

The integrated household solar power system converting solar energy high efficiently can help owner access to the electricity life easily. It can be used for various house appliances such as fans, lightings, device which charging handsets, household batteries etc.

The micro-grid solar hybrid power solution adopts the PV module to convert the solar energy into electricity and stores the electricity into batteries which power the load at night. The micro-grid solar hybrid power system can support the energy input from other source such as generator, grid power. It is mini-grids which mainly used for school, hospital, vaccination refrigerators, office building, island, army and residential community. The electrical diagram of integrated household solar power system is shown in blow figure.

Geographic footprint

Afghanistan, Bangladesh, Congo, Colombia, Ethiopia, Kenya, Mongolia, Nigeria, Pakistan, Sudan, etc.

"ZTE's strong capability of fast construction and deployment, which will help we build more green sites to strongly support our telecom network. We look forward to having further cooperation with ZTE Corporation."

Mobinil

Client list

Airtel
CMPak
Ethiopian Telecommunications Corporation
Etisalat
Econet
MTN
Mobinil
Sudan Telecom Company Co. Ltd

Zambia Telecommunications
Zain

Company

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