Green Power for Mobile

In Partnership with the Netherlands

Telecoms Renewable Energy Vendors/ESCOs Landscape in India

IFC International Finance Corporation
World Bank Group

Introduction

The GSMA Development Fund launched the Green Power for Mobile (GPM) Programme in September 2008 to extend mobile beyond the grid through the promotion of renewable energy technologies and energy efficient base stations. The programme is supported by International Finance Corporation (IFC).

The telecom sector in India has witnessed unparalleled growth by global standards in the last decade and continues to be one of India's biggest success stories. The Indian mobile industry is one of the largest markets today in terms of subscriber base[1], experiencing growth of an additional 10 million subscribers every month in 2010, albeit very low ARPU (~EUR 2.40 per month), and significant churn rates. Due to favourable market conditions and the attractive renewable solution business case for telecoms, most of the telecom vendors now operating in India propose, in their portfolios, solar or wind tailored solutions.

This document presents a summary of the current state of the Indian Mobile Telecom Market, an overview of the use of renewable energies for the mobile infrastructure and a listing of the main vendors/ESCOs operating on the Indian market. This analysis is based on current knowledge of the Indian Market as well as publicly available information from vendors, tower companies and mobile operators.

1 KPMG report published association with the Department of Telecommunications (DoT), Government of India and Federation of Indian Chambers of Commerce and Industry (FICCI) in December 2009

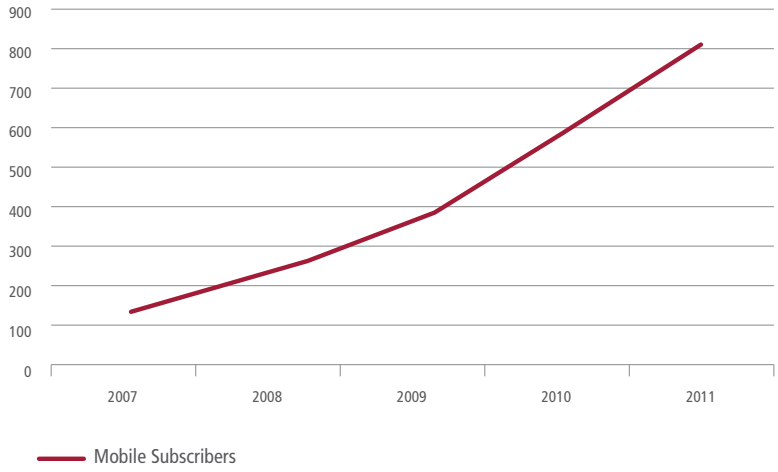
The India Mobile Market

India remains a dynamic market…

The country in divided into 23 telecom circles which have been classified into 4 categories: Metros, Category A, B and C. The 'metro' circles cover very dense population centers in the very largest Indian cities: Delhi, Kolkata, and Mumbai. The 'A', 'B', and 'C' circles cover various geographic territories of varying population sizes. 'A' circles are the largest in terms of population coverage. 'C' circles contain the smallest population.

The market is highly competitive with each telecom circle having 7-8 operators. Within the metro category, penetration rates are reaching over 100% making these areas of the market almost saturated. However, there is still great potential in other categories, particularly B and C, for further penetration and an increased subscriber base as these customers lie predominantly in off-grid and rural areas. Today the mobile market in India continues to be one of the most dynamic markets worldwide, with a growth rate of close to 45% in 2010 (Year on Year). At the end of 2011, the GSMA estimates there were 853,202,221 mobile subscribers in India which represents a market penetration of 72.23%[2]. This is close to the average mobile market penetration in the Asia Pacific region which is currently 73.70%[3].

Figure 1: Mobile Connections Growth in India (in million connections)



Source: Wireless Intelligence

By the 2nd Quarter of 2012, the total mobile subscriber base is expected to reach over 1 billion, driven by a rise in the demand for communications from semi-urban and rural India. With 70% of the Indian population living in rural areas, there is a major divide in mobile ownership between urban and rural areas. It is certain that rural markets will be the next key growth driver for the Indian telecom sector given the growing population and disposable income of rural India. This untapped rural market is estimated at 400 million people[4] , who live in areas covered by a GSM signal but who do not own a mobile phone.

2 Wireless Intelligence 2011
3 Wireless Intelligence 2011
4 Wireless Intelligence 2011

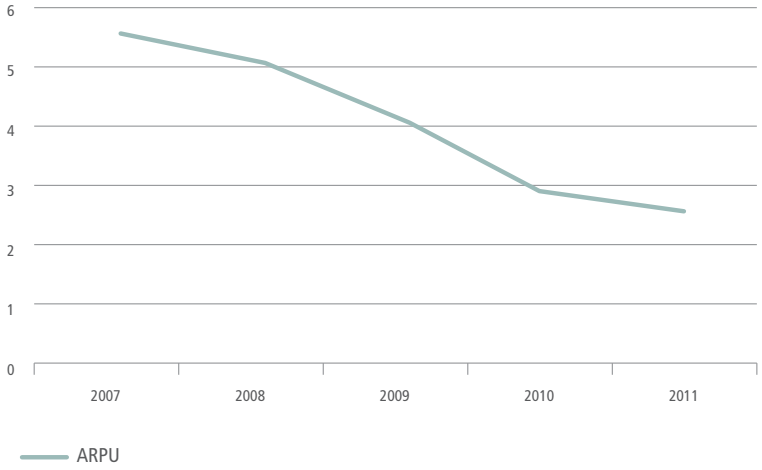
The main barriers to an enhanced mobile adoption are:

- Mobile network coverage could be improved: while the percentage of the population covered by mobile networks has been steadily growing since the early 2000s - to up to 75% of the population[5] today – certain areas lack reliable coverage and mobile users have sometimes to travel outside of their residential neighbourhood to make phone calls
- Poor electricity grid reliability: A lot of rural inhabitants do not have access, or only have unreliable access, to the electricity grid, preventing them to fully charge their phone.
- In a country where 25% of the population lives below the poverty line[6], the cost of mobile phone ownership remains too high for the lower part of the population

… Challenged however by falling ARPUs

Revenues of the Indian telecom industry were estimated at US$26 billion in 2008 and are projected to reach US$45 billion by 2012[7]. The latest blended ARPU available (2011) is estimated at EUR 2.40[8], one of the lowest worldwide - over the past 4 years, ARPU values have decreased by half. However, this decrease in ARPU is mitigated by the overall growth of the subscriber base, contributing to a steady revenue growth. Together with this, declining tariffs are compensated by an increase in the Minutes of Usage (MoU). India also has one of the highest Minute per User rates per month in the world - 343 minutes in 2011[9].

Figure 2: Blended ARPU Decrease in India (in EUR)



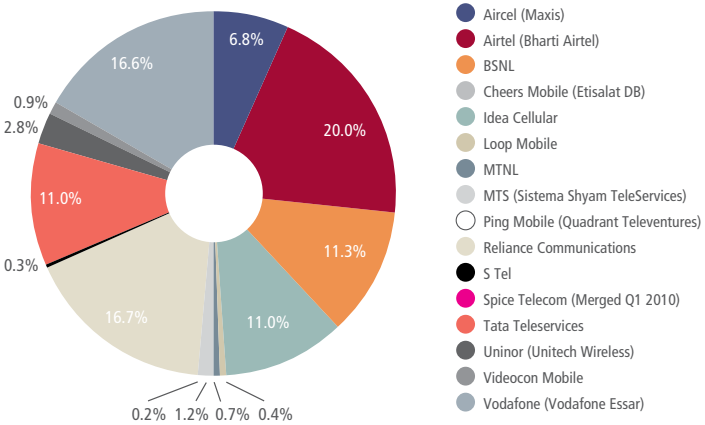
Source: Wireless Intelligence

5 GSMA -2010 – Based on coverage maps published by mobile operators
6 GSMA -2010 – Based on coverage maps published by mobile operators
7 UN data 2010
8 Consulate General of India in San Francisco
9 Wireless Intelligence 2011

15 Mobile Services Providers operate in India

A major share of the wireless market is currently being held by private players such as Bharti Airtel Limited, Reliance Communication, Vodafone, Idea Cellular, Aircel and Tata Indicom. The share of the private sector in total telephone connections grew to 82.3% in December 2009 from just 5% in 1999. The Telecom Regulatory Authority of India (TRAI) has actively contributed to the overall competitive landscape in the mobile market by encouraging the entry of new players, which has resulted in a total of 15 mobile service providers operating in India.

Figure 3: Mobile Operators Market Share in India (4Q2010)



Source: Wireless Intelligence

The Tower Outsourcing model

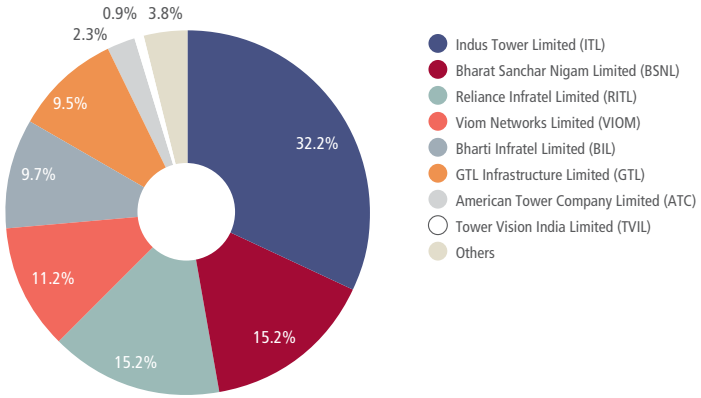
With the rapid growth of the Indian wireless market, initiatives such as network cost optimization, outsourcing of non-core activities, as well as low-cost business models have been in focus. Operators have been realizing efficiencies through extensive outsourcing across the telecom value chain. By separating infrastructure elements, such as towers, into separate entities, significant investments have been preserved, and the Indian mobile industry and its customers have benefitted from the sharing of passive infrastructure, reducing the cost burden of each operator and speeding the rollout of mobile services. India has now become a leader in sharing network infrastructure. As network costs typically represent between 15% - 25% of OPEX and 75% - 80% of CAPEX, the benefits of network sharing are obvious. Today, the tower industry continues to grow supported actively by the Government in India[10].

Telecom tower companies in India could be segmented into 3 types:

- Tower companies formed through joint ventures like Indus Towers Limited; joint venture between Bharti Airtel, Vodafone Essar and Idea Cellular
- Tower companies formed though de-mergers such as Bharti Infratel and Reliance Infratel, which are wholly owned subsidiaries of Bharti Airtel and Reliance Communications respectively
- Independent tower companies such as GTL Infrastructure ltd

As of August 2010, there were around 390,000 towers across India. However, this number may come down if the anticipated consolidation takes places among the telecom operators to share the same towers. Average Tenancy Ratio is estimated to 1.55[11].

Figure 4: Telecom Tower Companies Market Share in India (2010)



Source: ICRA Research and GSMA based on vendors

The expected growth in this sector is about 50,000 towers per year for the next 3 years beyond which GSMA believes a saturation point will be reached (i.e. all viable locations will be covered). In fact, most of these new towers would be located in rural areas where energy supplies (both electricity and fuels) are in short supply. To meet these as well as other challenges, the passive infrastructure companies and suppliers are increasingly turning to "Green Technologies" either to make power available in a location where this is a challenge or to make existing towers in rural areas become more efficient.

10 Recent online article published in Sept 2010
11 GSMA based on vendors information - Tenancy ratios are expressed as a fraction of total number of operators sharing towers/total number of sites present.

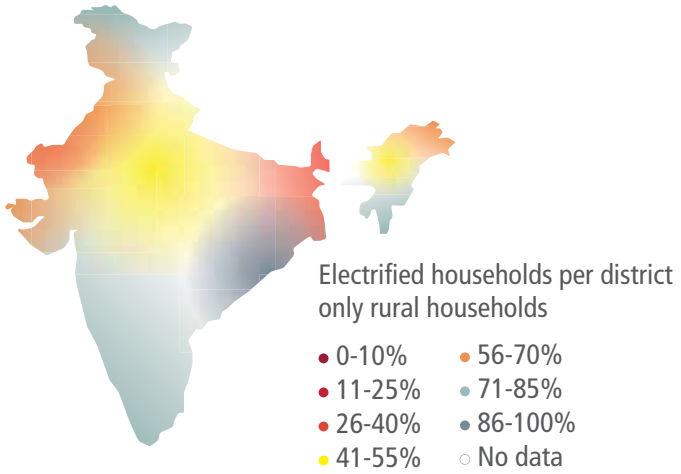
Green Power for Mobile Opportunity in India

Energy landscape

According to the Planning Commission of India statistics, the overall electrification rate in India is about 63%. Urban areas in India are typically very well connected to the electricity grid, even though they experience frequent power outages. Rural households, on the other hand, suffer from low electrification levels and according to the data from the Ministry of Power, Government of India (as described in the Rajiv Gandhi Grameen Vidyutikaran Yojana, RGVVY's documents), about 44% of rural households in India are electrified.

The Southern and Western parts of the country, in addition to some Northern states such as Punjab, Delhi and Himachal Pradesh, have higher electrification rates (>80%) than most Eastern states such as Bihar, Orissa, Jharkhand and North Eastern states such as Assam and some Northern states such as Uttar Pradesh. According to the RGGVY documents referenced earlier, the five states in India with the least village electrification levels, which depend on the number of villages with at least a single electricity connection (typically for public use such as lighting and water pumping), are Bihar, Jharkhand, Uttar Pradesh, Meghalaya and Arunachal Pradesh, with less than 75% village electrification levels. Bihar, Jharkhand and Uttar Pradesh, along with Assam and Orissa, also feature in the list of states that have the least household electrification levels in India, less than 20%. The following map[12] presents the regional electrification per district:

Figure 5: Percentage of electrified rural households per district



Calculations based on NSS data, round 55 (year 1999-2000)

12 Kemmler Andreas, Centre for Energy Policy and Economics, Swiss Federal Institutes of Technology, "Regional disparities in electrification of India – do geographic factors matter?", 2007

Green Power for Telecom Networks in India

Today, the opportunity to use renewable energy to power base stations is increasing thanks to several factors. The key reason for the rapid expansion in the Indian market is the move into lower margin rural markets as a way to increase subscribers, as average revenue per user has dwindled over the past few years in more mature markets[13]. Furthermore, the recent solar feed-in tariffs created by the Indian government is raising awareness across the country of renewable energy solutions for electricity demands, though the impact of the programmes on the telecom base stations remains limited.

Another important difference in the Indian market compared with other off-grid mobile telecom markets, is that the mutualization of power sources at the tower site, using renewable energy solutions in this case, is economically more attractive when the infrastructure is shared by multiple operators. Tower companies can install solar sites with loads in the 5-6kW range and still make the systems economical for customers.

Today, 60% of the power required for telecom towers in India is met by diesel generators. Consuming more than 2 billion litres of diesel per year, India's Ministry of New and Renewable Energy has asked telecom companies to consider cleaner, more efficient alternatives and ways to cut their dependency on conventional fuels. [14] Renewable energy offerings include solar panels, wind turbine technology, biomass and fuel cells. The most common technologies being used to supply off-grid BTS' currently are solar and wind, with solar being the more prevalent technology.

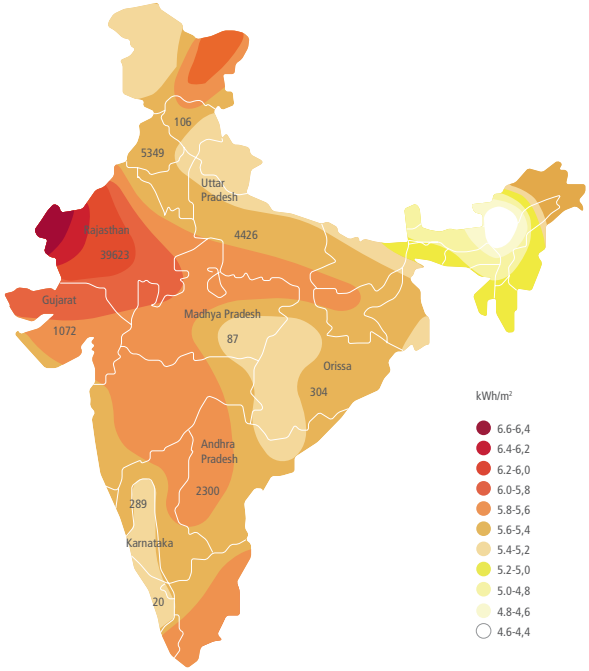
By interviewing a number of tower companies, it was found Indus Towers plans to set up 2,500 solar powered sites by end of 2011 and Bharti Infratel will rollout 1500 solar powered sites in a similar timescale. Other Indian telecom companies expect to deploy renewable energy sources as well. Viom Networks, which currently runs more than 38,000 towers, expects to operate a large number of their off-grid sites using solar power. American Tower Corporation ran pilot tests in Pune, Maharashtra and was able to reduce its monthly costs of diesel generators by half in that area.

Solar power solutions enjoy a strategic advantage over wind turbine technology in its ability to be deployed with a less onerous and technical pre-feasibility analysis requirement compared to wind. Existing solar maps provided by sources such as NASA are precise enough to predict solar resources to ensure sites are economically viable. Moreover, most parts of India receive good solar radiation (4-7 kWh/sq.m) therefore allowing solar solutions to champion the reduced consumption of diesel and kerosene for lighting and power generation.

13 GPM Energy Service Company (ESCO) & Vendor Research – Energy Efficiency Finance Corp – October 2010

14 http://energyefficiency.coolerplanet.com/News/2011032401-indias-telecom-industry-pushes-green-energy.aspx

Figure 6: Solar Radiation in India



Source: MNRE

Wind power solutions are not implemented as frequently in the Indian subcontinent as there is limited opportunity due to average wind speeds being deemed very moderate, bordering on impractically low. Sites with average wind speeds in excess of 3m/s may possibly be considered with an additional wind generator, but a lower limit of 5m/s would increase the likelihood of achieving more than 1kWh per day. At 10m/s, the entire system load could be handled by wind power alone, but significantly less than 10% of Indian sites are expected to have such favourable wind resources available. [15]

Fuel Cells solutions are also being field tested in India by some Telecom Tower companies. If this technology appears attractive, cost reduction still remains a major hurdle to a bigger scale implementation.

Figure 7: Green sites deployment in India

Source: Green Power for Mobile

At the end of 2010, the Green Power for Mobile programme estimated that India accounted for around 921 sites operating on renewable energies[16], with many more sites planning to be deployed in the next months.

15 Source VNL White Paper The Solar Imperative
16 Numbers of green sites is constantly updated and dependant on the public aspect of site deployments

Vendor/ESCO Landscape

The listing we are providing below summarises the main vendors active in the Indian market. At the top of the vendors list [17] are Moser Baer (who has their own turnkey BTS division), Reliance Solar, Tata BP Solar, Nokia Siemens Networks, ACME Tele Power and Applied Solar Technology. These companies are well positioned to take advantage of the rapid expansion of the off-grid telecom markets in India.

Bharti Infratel, for example, has already installed 750 solar sites and is expected to deploy an additional 1500 over the next two years. These sites are being developed using Applied Solar Technologies (AST) as the preferred ESCO. A number of the other tower companies in India also seem to be looking to use ESCO models.

Multinational companies noted that gaining traction in the Indian market has been difficult because of domestic Indian companies having local advantage due to their familiarity with the tower sharing model. The recent merger between Bharti Infratel and Zain suggests that the tower sharing model will gain market share in Africa as a number of companies are investigating this model.

Table 1: India Telecom Vendor Listing

Company	Core Competencies
Artheon Electronics	Energy Storage
Coslight India Telecom	Energy Storage
Luminous TeleInfra	Energy Storage
Prudent Energy Corporation	Energy Storage
DESI Power	Biomass
Next Gen PMS	Biomass
Husk Power	Biomass - Rice Husk
Flexenclosure	Community Power
AirLiquide/Axane	Fuel Cell
Electro PS	Fuel Cell
Cascadiant/Idatech	Fuel Cell
Mahindra Powerol	Gensets
Bhaskar Power	Gensets
Pace Power	DC generator
Altobridge	Picocell
VNL	Picocell
Emerson Network Power	Power Equipment
Qowisio	Power Resource Management
Apollo Solar	Solar
Applied Solar	Solar
Indo Solar	Solar
KMR Energy	Solar
Moser Baer	Solar
Reliance Solar	Solar
Sun Edison	Solar
Tata BP solar	Solar
Vikram Solar	Solar
XL Telecom & Energy	Solar
Delta Group	Solar Inverter, Panel, Wind Turbine
BS Transcomm	Solar, Wind, Smart Energy meter
ACME	Telecom Equipment
Alcatel Lucent	Telecom Equipment
Ericsson	Telecom Equipment
Huawei	Telecom Equipment
Nokia Siemens Network	Telecom Equipment
Power Oasis	Telecom Equipment
Luminous Renewable Energy Solutions (former UD Energy)	Wind Solar Diesel Intelligent Hybrids
Bergey WindPower	Wind Turbine
Unitron Energy	Wind Turbine
Zephyr Corporation	Wind turbine

17 No quantification and market shareW of each vendors could be possible as most of the contracts are not public

Artheon Electronics

ARTHEON ELECTRONICS LTD. one of the flagship company of the Artheon group company in India is setup as a professional supplier and manufacturer of VRLA Batteries, to provide their customers with stable high quality batteries and extremely efficient power solutions.

The Artheon group encompasses several companies in the field of Telecom, Information Technology and Renewable energy.

Project Locations

India

Latest Press Releases

January 2010 - Artheon Group announces JV with NorthStar Battery.
Artheon Group ("Artheon") India, NorthStar Battery Company ("NorthStar") of Sweden and the MTS Group USA are pleased to announce they have entered into a joint-venture, Artheon Battery Company Pvt. ltd, to manufacture and market storage batteries.

Artheon Battery Company Pvt. ltd, located in Nashik (130Kms from Mumbai), will manufacture a complete line of lead-acid batteries serving both the domestic battery markets in India and the export markets around the world.

Officials at the companies say the new venture will combine the industry-leading manufacturing and technology capabilities of NorthStar, and the distribution and service capabilities of Artheon across India. Together, the companies will create a leading-edge new player in the Indian battery markets.

Company
Artheon Electronics
S-34, Okhla Industrial Area, Phase-II
New Delhi-110020

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Email
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+91-11-40516480

Coslight Telecom India

COSLIGHT TECHNOLOGY INTERNATIONAL GROUP CO., LTD. was established in 1994, and listed at Hong Kong United Stock Exchange in 1999, is specialist of storage solutions and batteries.

As one of the "Top 100 Electronic Enterprises in China", the Group now has 21 subsidiaries such as Harbin Coslight Storage Battery Co., ltd. and Harbin Coslight Power Co., ltd., 13 overseas subsidiaries or offices in Russia, Germany, Britain, Italy, Turkey, the United States, Canada, etc. and a postdoctoral workstation and an institute.

The company is a Global approved Vendor for VODAFONE and their products are supplied for various Telecom Projects across the globe.

Project Locations

Global

Latest Press Releases

Not available

Company
Coslight Telecom India
212, TIME TOWER, M.G. ROAD, SEC.-28, Gurgaon - 122001, Haryana, India

Website
http://coslightbattery.en.busytrade.com/about_us.html

Email
info@coslight.com.hk

Luminous Teleinfra ltd

Luminous Teleinfra Limited, founded in 2008, manufactures deep-cycle telecom batteries, power management units, and power conversion devices and solutions for telecom operators.

The company was founded in 2008 and is based in Manesar, India. Luminous Teleinfra Limited operates as a subsidiary of SAR Group.

Project Locations

India

Latest Press Releases

July 2010 - Luminous Teleinfra launches VRLA batteries for Telecom cell sites
Luminous Teleinfra ltd which is part of the SAR Group launched deep cycle VRLA batteries for Telecom cell sites. "Taking into account the fast-growing economy that works 24x7 in, there has been a growing need for a highly reliable and virtually maintenance free power back-up solution that meets the expectations of the subscribers of telecom network operators," said Mr. Rakesh Malhotra, Founder & CEO. According to Luminous, the VRLA batteries provide reduced cost of ownership and usage as well as offer highest energy storage in a small footprint.

Company
Luminous Teleinfra ltd
Plot No. 121, Sector - 5,
IMT Manesar, Manesar,
122050

Website
luminousteleinfra.com/

Telephone
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Prudent Energy Corporation

Prudent Energy, a leading clean energy company, is the designer, manufacturer, and integrator of the patented Vanadium Redox Battery – Energy Storage System (VRB-ESS®) – a large-capacity energy storage system delivering high performance with low operating costs. The Vanadium Redox Battery (VRB®) is a patented advanced energy storage system that is safe, environmentally friendly and operates at the lowest cost of any flow battery technology.

The VRB® can be described in several ways. It is:

- An electrochemical system that efficiently converts chemical energy to electrical energy, and vice versa, based on the reduction and oxidation of different forms of the element Vanadium.
- A 'flow battery' that rapidly charges and discharges, offering unlimited deep cycle capability.
- An on-demand energy storage system where:
  - a) The electrolyte never wears out and overall maintenance costs are extremely low;
  - b) Energy (electricity) can be stored in liquid form, at room temperature, almost indefinitely;
  - c) Operators can easily add energy and power in modular fashion over time.
  - d) It can be charged and discharged to any state of charge with no adverse effects on life cycle.

Product and Service Description

Prudent's 7kW-rated units are sold separately (on a containerized basis or otherwise depending on customer needs) for use at telecom base stations in remote areas around the world. These small systems have been proven reliable and high-performing in over 20 installations in North America, Europe and Africa.

Conventional VRLA battery systems used in telecommunication cell sites are designed to act as backup devices for infrequent, short power interruptions per year. However, Prudent's enhanced kW-class, 8-hour maximum deep cycling storage system, now in its third generation, allows off-grid or weak grid telecom sites to cycle repeatedly or integrate in hybrid form with diesel, wind, or photovoltaic generation. VRB-ESS® units operating in Africa typically deliver an attractive two-year payback by reducing O&M costs and extending diesel engine life.

Financial Savings

Typical opex savings on an off-grid site running 24 hour per diesel generators is 50%. Total Cost of Ownership saving over 4 years is 35% compared to conventional VRLA battery storage systems.

Geographical Footprint

Global, off-grid and poor grid installations.

Client Listing

kW-Class (VRB kW-Class®) Projects

Application	Region
Telecom service provider	Turkey
Telecom service provider – diesel usage reduction/ green off grid cell sites	East Africa
USA installations at various sites (extreme conditions) and on islands	USA
UAE telecom application – off grid diesel reduction	Middle East
Commercial end user PV integration	China
Italian Energy services provider – integrated with PV. Peak shaving	Italy
Telecom service provider – weak grid support	Hungary
Korean clean tech research university	Korea
Green Energy services provider – integrated with renewables	Slovakia
Telecom off-grid service provider – integrated with PV	India

Company
Prudent Energy Corporation
7200 Wisconsin Avenue
Suite 1002
Bethesda
MD 20814
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Website
www.pdenergy.com

Email
sales@pdenergy.com

Telephone
1-301-825-8910

DESI Power

DESI Power is a startup aiming to establish itself as a pioneer in BOP energy services for rural India.

The company has built an innovative model around providing villages with cheap, biomass-based energy generators that employ local residents and supply them with a stable, predictable means to pump water and charge batteries for basic appliances.

The first DESI Power station was set up at Orchha, Madhya Pradesh (India) in April 1996, as a joint venture between FREND a Swiss non-profit organization that promotes renewable energy and TARA. Together they provided roughly 50% of the equity capital, which was 25% of the total investment. The plant was fabricated and commissioned by Netpro.

DESI Power is a decentralized energy system. It is a state-of-the-art technology that converts Biomass. The biomass is burned with limited supply of oxygen to generate combustible gas which in turn produces electricity.

Using renewable resources to run these power systems, Desi power systems currently provide energy services to villages, small businesses and educational institutions. DESI Power is part of the Smart Power for Environmentally and Economically Sound Development (SPEED), an initiative of the Rockefeller Foundation that was initiated in 2008-09. SPEED aims to address the needs of approximately one-third of the world's population that do not have access to electricity (1.6billionpeople).DESIPowerhasbeenworking withBhartiInfratel,Vodafone,TataIndicom,Tata docomo.

Project Locations

India

Latest Press Releases

Not available

Company
DESI Power
212, TIME TOWER, M.G. ROAD, SEC.-28, Gurgaon - 122001, Haryana, India

Website
www.desipower.com

Email
desipower@airtelbroadband.in / desipower@vsnl.com

Telephone
+91-80-41328160

Next Gen PMS

NextGen, incubated at NSRCEL, IIM-Bangalore and founded in 2009, operates in two major domains - Emission Management and Waste to Energy.

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.

Around Rs. 50 lakh of its annual revenue last year came from its biogas plant installations, a technology it developed in collaboration with IISc and BITS, Pilani.

NextGen's plan is to use this technology to power rural telecom towers. "We have a 40% subsidy from the government for capacity expansion in rural areas and are in talks with telecom companies to make it happen. They are very interested," she says.

Setting up biogas plants for rural telecom towers will also encourage village-based entrepreneurs who will be owners of the plants. The firm, which won a business-plan writing contest, now has 13 employees, excluding Bajpai and Humbad.

Project Locations

India

Latest Press Releases

Not Available

Company
Next Gen PMS
5, N.S.Raghavan Centre for Entrepreneurial
Learning Indian Institute of Management Bangalore
Banerghatta Road, Bangalore
– 560076 Karnataka, India

Website
nextgenpms.com/

Husk Power

Husk Power Systems (HPS) is premised on a simple need for electricity and a simple material discarded rice husks.

The for-profit social enterprise was started in 2007 by three Indians from the state of Bihar, along with one American classmate from the University of Virginia's Darden School of Business. It is this philosophy of simplicity and corresponding success that has earned them substantial investments from the Shell Foundation and Acumen Fund and the prizes of a host of social innovation business plan competitions. Already 60 rice husk power plants are up and running, serving 60 villages and 150,000 people. Now there are plans to run a Husk Power University and an international franchising system. By 2014, HPS plans to serve ~ 6,500 villages, save 750,000 tons of CO2, create 7,000 local jobs and save $50M in cash for over 5 million people by replacing kerosene and diesel with its proprietary renewable energy technology.

Project Locations

India

Latest Press Releases

June 2011 - Husk Power Systems win international sustainable energy award

http://www.business-standard.com/india/news/husk-power-systems-win-intl-sustainable-energy-award/138690/on

Shell Foundation's Husk Power Systems has won this year's International Ashden Award for Sustainable Energy. It was awarded at an official ceremony in London on Thursday night. Husk Power Systems (HPS) is a rural electrification company in Bihar which generates electricity through the gasification of rice husk, an abundant agricultural waste product found throughout India's rice belt.

Company
Husk Power Systems Pvt. ltd Opp. Shiv Mandir
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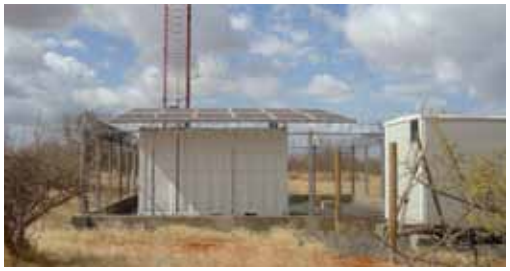
Flexenclosure



flexenclosure

Flexenclosure is a specialist provider of intelligent and "green" site power management solutions that have been especially developed for off-grid markets in developing countries. The company's revolutionary E-site base station site solution, with the Community Power option, has the proven ability to bring both communications and power to rural people in remote areas that previously had access to neither.

Client List
Safaricom
Airtel
MTN
Emtel
Millicom

Flexenclosure develops and deploys modular energy solutions that enable mobile operators to serve old and new, often rural, markets in an efficient and cost effective way. Flexenclosure's turn-key modular "green" energy solutions are based on renewable energy sources and are flexible, prefabricated, adaptable to local conditions and quick to install. Flexenclosure's product range contains solutions from power systems to complete data centers.

Product Description

E-site is an energy solution that enables base stations to be powered mainly by renewable energy (sun and wind). There is a battery bank for storage of generated energy and the wind turbines have been modified and perfected for this particular purpose. The key ingredient is Diriflex, the real-time control system used to optimize the performance of the solution.

The E-site solution has proved to reduce base stations' diesel consumption and CO2 emissions, by as much as 90 percent when they are running on a 24/7 basis, and to reduce energy related operating expenses by over 80 percent. The ROI is high and the long-term TCO low. This enables operators to profitably roll out base stations in areas that have so far been unprofitable to operate in due to low average revenues per user, lack of access to the electricity grid and high costs for diesel fuel and maintenance.

Community Power is an E-site product developed together with Ericsson. It also comes as a standalone system. The system provides the possibility to share the power produced by E-site with the surrounding local communities to power e.g. mobile and battery chargers, street lights, clinics, schools etc.

The complete Community Power solution allows for full integration with the operator's messaging and billing systems, including central management of energy distribution to local outlets and appliances based on end-user energy purchases using their mobile phones.

"On E-site solution we believe the product is very good and a step in the right direction in making GSM sites more power efficient. We particularly like the intelligent power monitoring system and the innovation to have wind turbines designed for telecoms. The great reduction in generator running hours is a welcome move towards a green economy."

Samuel Mugo Kimani, HoD Regional NW Dep, Safaricom.

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Flexenclosure
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SE-534 50 Vara
Sweden

Website
www.flexenclosure.com

Email
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+46 702 260 774

Air Liquide/Axane

Air Liquide is a major French company supplying industrial gases and services to various industries including medical, chemical and electronic manufacturers. Axane is a wholly owned subsidiary of the AIR LIQUIDE Group whose mission is to develop at a global level complete packaged systems for the generation of energy from Fuel Cells powered by hydrogen. Axane's market position in the area of hydrogen energy solutions gives it penetration into different niche markets, for which there is currently no satisfactory alternative energy solution, such as portable power generation, extended backup power, several industrial applications and stand-alone power for remote sites etc.

Axane's versatile power sources, in a power range from 0.5 to10 kW, offer a response to these issues in terms of ease use, operability, size, silence etc.

Project Locations

Global

Latest Press Releases

January 2011 - India: new developments in the west of the country

http://www.businessweek.com/globalbiz/content/may2009/gb2009051_422522.htm

Air Liquide is announcing new developments in the west of the country, in Gujarat and Maharashtra. The total investment for the new facilities and the supply chain amounts to more than €40 million.

Air Liquide has commissioned a new state-of-the-art Air Separation Unit (ASU) to produce gaseous nitrogen for the new float glass plant of Sezal Glass ltd. in Jhagadia, in Gujarat (investment announced in January 2010)

December 2010 - Air Liquide Testing Hydrogen in Base Stations in India

http://www.fuelcelltoday.com/online/news/articles/2010-12/Air-Liquide-Testing-Hydrogen-in-

The Telegraph (India) has published a press release stating that Air Liquide will undertake a pilot project with Bharti Airtel to run telecom towers using hydrogen. In the first phase, the French firm will test the technology with 10-15 base stations. The Indian government Department of Telecom (DoT) is drawing up plans to provide subsidies and incentives to operators to switch to and use renewable energy, including hydrogen, at base stations. Some of the incentives could include a 30 per cent subsidy on the total cost of making 200 towers "eco-friendly".

Company
Air Liquide/Axane
Air Liquide (Siège Social)
75, Quai d'Orsay - 75 321
Paris

Website
http://www.axane.fr/default_gb.cfm

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+33 (0)1 40 62 55 55

Electro PS

Electro Power Systems, founded in 2005 and based in Italy, is an established player in the sector of fuel cell systems for mission-critical backup power applications.

ElectroPS already has a field-proven product family of fuel cell systems for backup applications covering the range from 1.5 to 12 kW. Their products have the largest installed basis in Europe.

Project Locations

Europe, India, North America

Latest Press Releases

December 2010 - Electro Power Systems officially launches in India ElectroSelf, the first self-recharging fuel cell system for backup power

http://www.electrops.it/pr_20101201.html

Electro Power Systems SpA is officially launching in India ElectroSelf, the world's first entirely self-recharging fuel cell system for backup power at India Telecom, New Delhi (stand in hall 14). A preview of ElectroSelf was presented in February 2010 at Mobile World Congress 2010 in Barcelona and, after being successfully trialled in Europe, Americas and Asia, it is now ready to pave the way to fuel cell adoption overall India.

The trials, including those made in India, proved that ElectroSelf generates significant savings for operators and tower companies while overcoming the problems related to legacy solutions (i.e. fuel logistics, frequent on-site checks and heavy maintenance).

Company
Electro PS
Torino
Via Livorno, 60
10144 Torino
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Website
http://www.electrops.it/index.html

Telephone
+39 011 2258211

Cascadiant/Idatech

Cascadiant is a specialist of Fuel cell products. Partners include Interop Technologies, Idatech, PowerOasis, Statmon. Cascadiant is committed to providing operators with a full array of energy solutions that allow their infrastructure and network operations to reduce its carbon emissions and footprint.

Project Locations

India, Asia Pacific

Latest Press Releases

June 2010 - IdaTech and Cascadiant Showcase Backup Power Fuel Cells at CommunicAsia

http://www.idatech.com/uploadDocs/061510CommunicAsia.pdf

IdaTech plc, a global leader in the development and manufacture of clean and reliable extended run backup power fuel cell products, in conjunction with its partner Cascadiant Inc., is pleased to announce its participation at CommunicAsia.

Participating for the fourth year, IdaTech, together with Cascadiant will promote its next generation ElectraGen™ ME Fuel Cell System—a five kilowatt fully integrated solution that enables extended run backup power for telecom base stations.

April 2010 - IdaTech And Cascadiant Announce A Deployment Of Advanced Fuel Cell Technology With Hutchison Telecom In Indonesia

http://www.idatech.com/uploadDocs/041410_IdaTech_Cascadiant_Deployment.pdf

IdaTech plc (AIM: IDA) a global leader in the development and manufacture of clean and reliable PEM fuel cell products for critical backup power markets, in conjunction with its partner Cascadiant Inc. and Indonesian wireless operator PT Hutchison CP Telecommunications (HCPT), is pleased to announce a deployment of the latest generation of hydrogen backup power fuel cell systems throughout the Indonesian island of Sumatra.

Company
Cascadiant/Idatech
Cascadiant Singapore
10 Anson Road, #21-12
International Plaza
Singapore 079903

Website
cascadiant.com
idatech.com

Telephone
+65 6220 6418

Mahindra Powerol

Mahindra Powerol is providing power back-up solutions to India that ensures an uninterrupted power supply for all the critical sectors of the economy.

Their line of diesel generators offers electricity backup to remote locations to power banks, hospitals, schools, businesses, and industry. Mahindra Powerol DG sets are provided to Telecom majors like Airtel, Tata Tele, Vodafone, Nokia, BSNL and MTNL who use the same to support their communication networks across India. Mahindra Powerol has recently launched B100 bio diesel Generator Sets for the Indian Market. The usage of bio diesel fuel (as per IS 15607 2005) would be applicable for all the current range of Mahindra engines between 7.5kVA and 62.5kVA. Mahindra Powerol plans to extend this to other range of engines in the near future.

Project Locations

India, Middle East, Africa, Latin America

Latest Press Releases

January 2008 - Launch of India's 1st 100% Biodiesel fuel genset

http://www.mahindrapowerol.com/Admin/tmpupload/biodiesel.pdf

The Mahindra Powerol B100 Biodiesel Genset uses an electronic controller which ensures start and stop in diesel mode and switching to biodiesel mode while running of the generator set. Two separate tanks inside the generator set ensure seamless switching between both modes. The use of biodiesel fuel (as per IS 15607 - 2005) will be applicable for the current range of Mahindra engines starting from 7.5kVA up to 62.5kVA. Mahindra Powerol plans to extend this technology to its other range of engines in the near future.

Company
Mahindra & Mahindra ltd., Engine Application Business (Powerol), Farm Equipment Sector, Gate No.2, Akurli Road, Kandivali (East), Mumbai - 400 101, Maharashtra

Website
mahindrapowerol.com

Telephone
91-22-6648 3051

Bhaskar Power

Bhaskar Power is manufacturing gensets (over 28,000 gensets already installed claimed).

The company is adding almost 3000 per year for power generation in India and abroad. Bhaskar has provided power to telecom companies like Airtel, Hutch in states of Bengal, Orissa, Jharkhand, Bihar, U.P., Uttranchal, Haryana, Punjab, Delhi, Rajasthan, M.P., Gujarat, Maharashtra, A.P. Other industrial, infrastructural, research, educational, healthcare and petroleum segments use their gensets across the country.

Project Locations

India

Latest Press Releases

Not Available

Company
Bhaskar Power
B-137, Sector-2
Noida-201 301
U.P. (India)

Website
bhaskarpower.com

Email
bhaskarp@nda.vsnl.net.in

Telephone
(0120) 2552080/81, 2521355/75, 2533453/54

Pace Power

Pace Power is a power solution provider for Telecom industry. It is specialized on providing power solution for unavailable or non-reliable grid site.

Based in Bangalore, PACE operates over 50,000 sft manufacturing plants with over 825 employees worldwide. Pace has a pan India presence and provides power solutions to all major Telecom Operators, Network Equipment Vendors (OEM's), BOL Operators, TSP's, Enterprise & Industries.

Project Locations

India

Latest Press Releases

Not Available

Company
Pace Power
Unit 2, Plot 27-A, First Phase KIADB, Mysore road, Kumbalgodu
Bangalore 560074

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pacepowerindia.com

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+91 80 284 37795

Altobridge

Altobridge is an R&D-focused, wireless network solut ons provider. Its founding vision was to remove the technical and commercial barriers that denied remote communities affordable mobile voice and internet connectivity.

Since its creat on in 2002, Altobridge has designed, patented and commercially deployed technology innovat ons that have bridged the digital divide; breakthrough solut ons that now enable mobile network operators, part cularly in low and lower-middle income nat ons, to affordably connect unconnected communities. In its early years, Altobridge developed and commercially deployed the solut ons behind the world's fi rst commercial GSM service on board passenger aircraf , and the world's fi rst commercial deployment of GSM connect vity on board deep-sea merchant marit me vessels globally.

ALTOBRIDGE™

Connecting the Unconnected

Advancing from these breakthroughs, Altobridge focused its resources on solving the technical and commercial barriers that prevented mobile network operators from cost-effect vely extending their networks, beyond their urban strongholds, to populat on centres in rural and remote regions throughout emerging markets - communit es yet to reap the social and economic benefi ts of mobile connect vity.Today, 1.6 billion adults – 23% of the world's populat on globally - are not connected to a mobile network. In Sub-Saharan Africa, rural mobile penetrat on rates are below 10% in most cases.*Altobridge has set about removing the three greatest barriers that mobile network operators face in terms of rural and remote network expansion, namely: (1) the capital costs involved in deploying tradit onal infrastructure, such as 30+ metre telecoms towers, which operators perceive to be pre-requisite for rural deployment; (2) the operat onal costs required to drive power-hungry base stat on transceivers; (3) the monthly transmission costs (the backhaul costs) incurred to deliver voice calls and mobile data traffic to and from users' devices.

Altobridge has achieved this through a series of patented and patent-pending technologies, namely, Altobridge Data-at-the-Edge™ (data opt mizat on in wireless networks), Local Connect vity™ (local voice switching) and Split Architecture™ (transmission and power opt mizat on). These technologies, individually and combined, drive down communicat ons delivery costs for mobile network operators by reducing backhaul and power consumpt on costs.

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For further informat on, please contact:
Gerry Collins
Head of Business
Development

gerry.collins
@altobridge.com

*GSM Associat on 2010, Informa Telecoms & Media 2010

VNL

VNL is providing the WorldGSM™ system, the solar powered turnkey GSM system specifically made for rural areas with ARPUs of less than $2. WorldGSM™ is the first commercially viable GSM system that is independent of the power grid. It runs exclusively on solar power and requires no diesel generator backup. It is also designed for simple delivery and deployment by local, untrained workers – all resulting in zero OPEX, dramatically lower CAPEX, and near zero maintenance. VNL, based in Haryana, India, has reengineered the traditional technology of the dominant cellular standard, called GSM, in order to create base stations that only require between 50 and 150 watts of power, supplied by a solar-charged battery.

The components can be assembled and booted up by two people and mounted on a rooftop in six hours. To date, some 50 VNL base stations have been installed in the Indian state of Rajasthan.

Project Locations

Asia, Africa

Latest Press Releases

January 2011 - VNL's Mobile Communication Solution for Developing Countries Testing Use of Boston-Power's Lithium-ion Battery System

http://www.vnl.in/blog/2011/vnl%E2%80%99s-mobile-communication-solution-for-developing-countries-testing-use-of-boston-power%E2%80%99s-lithium-ion-battery-system/

VNL and Boston-Power, two World Economic Forum Technology Pioneer Award recipients, today announced a cooperation intended to provide long lasting, green energy storage to a telecommunications solution that is already delivering the transformative capability of cellular and broadband services to rural geographies worldwide, outside the reach of the mobile telecommunications network footprint.

February 2010 - VNL Wins Green Mobile Award for Best Green Programme Product or Initiative

http://www.vnl.in/blog/2010/live-from-mobile-world-congress-vnl-wins-green-mobile-award-for-best-green-programme-product-or-initiative/

VNL is proud to announce the receipt of GSMA's 2010 "Green Mobile - Best Green Programme Product or Initiative" Award during Mobile World Congress' Global Mobile Awards Ceremony. The judges stated that selection was made based on the sheer number of people whose lives could be changed through deployment of VNL's technology:

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VNL
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Haryana

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Emerson Network Power

Emerson Network Power provides innovative infrastructure solutions that maximize reliability, deployment speed and efficiency for communications networks. We are experts in leveraging hybrid technology to minimize OPEX costs and reduce the carbon footprint associated with GSM in areas with limited access to grid power.

Emerson's infrastructure solutions keep telecommunications and IT networks up and running regardless of whether the content is voice, data or multimedia.

Product Description

Hybrid energy solutions from Emerson offer smart integration of renewable and traditional energy sources for indoor or outdoor environments in off-grid or on-grid peak shaving applications. Our reliable DC power supply systems in combination with hybrid power sources such as solar, wind, diesel and batteries, provide intelligent site management and integrated control.

Hybrid energy solutions from Emerson:

- Reduce energy consumption significantly with integrated energy optimization and temperature control technologies
- Minimize carbon footprint by an average of 30% utilizing hybrid energy solutions
- Maximize energy savings with eSure™ high efficiency rectifiers
- Leverage modular enclosure designs that enable flexible expansion and easy maintenance in the field
- Achieve significant OPEX savings through remote monitoring and comprehensive battery management capabilities

An integral part of our hybrid energy solutions is the eSure™ high efficiency rectifier. When compared to traditional rectifiers in the market today, eSure™ DC power technology significantly reduces CO2 emissions and operational costs, offering the highest efficiency in the industry at 97 percent. Efficiency can be boosted even further with ECO mode, a patented technology in our advanced controllers. By running only the number of rectifiers required for normal load conditions, maximum energy optimization can be achieved.

Geographic Footprint

Worldwide.

Trust and enlist Emerson to manage all aspects of your critical infrastructure needs.

Company
Emerson Network Power
4530 Weaver Parkway
Warrenville, Illinois
60555 USA

Website
EmersonNetworkPower.com/EnergySystems

Email
EnergySystems@Emerson.com

Qowisio

Qowisio is specialized in the provision of a 100% wireless 'end to end' solutions to improve the management and the monitoring of telecom site's power resources.

Qowisio helps mobile operators to decrease significantly your Operational expenditure:

1) Saving by 65% to 80% fuel on GSM site working 24H on genset
2) Reducing the frequency of site visit
3) Detecting and reducing fraud (fuel theft in the tank ...)
4) Cross checking invoices from subcontractors (detect refuel volumes, KWH)
5) Reducing diesel overstock

Product Description

- Qowisio Fuel tank monitoring: supervision of the fuel tank
- Qowisio Power Metering AC: generator and grid power AC power quality and consumption
- Qowisio Power Metering DC: DC power information (power, consumption, current, voltage)
- Qowisio Generator Monitoring: remote automatic start/stop of the generator, running time of generator, basic alarms
- Qowisio Hybrid solution: Automatic start/stop of the generator according to batteries load measurement and calculation (batteries provisioning as an option)
- Qowisio Tri-brid solution: Automatic start/stop of the generator according to batteries load measurement and solar panel power delivery (batteries provisioning and solar panels as an option)
- Qowisio site management extension (temperature, door open/close, dry contacts etc...)

Geographic Footprint

Qowisio has a world wide coverage through local partners and representatives.

Company
Qowisio
8 rue de la Vallée
ZA du rézeau
49800 Andard
France

Name
Xavier EME
Sales Director

Apollo Solar

Apollo Solar is an engineering, manufacturing, and sales organization with over 40 years of expertise in the design and manufacture of power electronics for NASA, the US Military, and numerous Fortune 500 clients.

Apollo Solar now provides a new generation of highly reliable and highly efficient Complete Off-Grid PV Power Systems in a full line of inverters, charge controllers, and communications modules, quickly integrated through modular design for fast, fail-safe installation and use.

Apollo Solar PVforTelecom System® in IP66 Enclosure

Apollo Solar is also the recent recipient of the U.S. Department of Energy (DOE) Contract Award, under the Solar Energy Grid Integration System (SEGIS) Program, for the development and deployment of a grid-interactive Solar Inverter Control and Communications System for the Smart Grid. Apollo Solar specializes in innovative heat-reduction electronics design which increases system performance and component reliability while reducing the upfront and life-of-system costs of the solar energy generated.

Product and service description

Built on the robust T80 and T80High-Voltage-Input (200Voc) battery charge controllers, the Apollo Telecom Systems integrates MPPT, State-of-Charge data and energy charge management with monitoring communications into a single product. The Apollo Systems include circuit breakers for all power lines, robust lightning surge protection, optional ground fault protection on all PV inputs and combiner-box breakers for multiple PV inputs.

Complete remote monitoring via local wire, ethernet, or cellular modem, with optional SNMP Gateway and custom screens and alarms. Designed for 48 volt, positive-ground (+) battery, the Systems are certified to UL1741 & CSA C22.2 No. 107. With remote monitoring of the PV source, batteries, load current, and internal charge controller functions, data is logged every 10 seconds on: Voltage and current on PV input, batteries, load, internal and battery temperatures, Battery-State of-Charge, Energy Harvest, Diagnostics, and Alarms on all vital parameters such as load disconnect on low battery State-of-Charge.

Geographic footprint

Apollo Systems are installed and operating on every continent.

Existing client list (must be public information) (maximum 10 company names – must be telecoms clients)

Client testimonials/quotes (three quotes – maximum 100 words in total)

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Bethel
CT 06801
USA

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Email
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apollosolar.com

Telephone
US 203 790 6400

Applied Solar Technologies India Pvt

Applied Solar Technologies (AST) is a solar PV based off-grid power solution company that provides solar power to telecom towers that typically rely on diesel-based generation for 50 – 100% of their power requirements.

The company is adding almost 3000 per year for power generation in India and abroad. Bhaskar has provided power to telecom companies like Airtel, Hutch in states of Bengal, Orissa, Jharkhand, Bihar, U.P., Uttranchal, Haryana, Punjab, Delhi, Rajasthan, M.P., Gujarat, Maharashtra, A.P. Other industrial, infrastructural, research, educational, healthcare and petroleum segments use their gensets across the country.

Project Locations

AST's projects will be at multiple sites in primarily rural areas of India's states of Bihar, Uttar Pradesh, Orissa and Rajasthan

Latest Press Releases

April 2010 - "AST plans to install its solution in about 10,000 telecom tower sites in next few years. IFC is considering an investment of a total of up to $21 million in the Company in a combination of equity and debt."

http://www.ifc.org/ifcext/spiwebsite1.nsf/0/670F11511CF18FAF8525770C004E213D

Company
Applied Solar Technologies (India) Pvt ltd C-122, Defence Colony, New Delhi – 110 024

Website
http://www.appliedsolartechnologies.com/astdmc2/login.aspx

Telephone
+91 11 4155 2066

Indosolar

Indosolar manufactures poly-crystalline solar photo-voltaic ("SPV") cells from silicon wafers utilizing crystalline silicon SPV cell technology for converting sunlight directly into electricity through a process known as the "photo-voltaic effect".

The company markets and sells products to primarily module manufacturers on a business-to-business platform, who in turn supply to the system integrators who install the systems for grid and off-grid (roof top) applications for use in the domestic market as well as markets in Europe, Spain, Japan, Asia, Canada and USA.

Project Locations

India

Latest Press Releases

September 2010 - Indosolar raises INR 3.5 billion to establish new solar cell production line

http://www.pv-magazine.com/news/details/beitrag/india--indosolar-raises-inr-35-billion-to-establish-new-solar-cell-production-line_100001227/

India-based IndoSolar Limited has announced it is to add a new 100-megawatt (MW) production line to its 300,000 square foot solar cell facility - located around 55km from Delhi airport, in northern India's Uttar Pradesh state - after raising INR 3.5 billion in public financing.

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KMR Infrastructure

KMRI designs, finances, installs and operates renewable energy plants and offers customers power purchase agreements (PPA) that help them go green while reducing operating cost and avoiding capital expenditure.

KMR infrastructure's distributed energy model is developed by extensive study of 40 different renewable energy programs across the world, in conjunction with energy group of the World Economic Forum (WEF Davos) group. The company created a best practice framework identifying various key elements needed to make a scalable network of small renewable energy projects. Using this framework the company identified many target markets in Asia and Africa and has been rolling out their first set of projects based a robust financial and operational delivery platform.

KMR Infrastructure has developed a "Franchise Fund" model that will help small scale renewable energy based franchises by creating an end-to-end industry value chain that will provide assistance in all areas starting from project conception, financing, technology selection, procurement, project management, operations support and training and after sales maintenance and service.

Project Locations

Asia and Africa

Latest Press Releases

Not Available

Company
KMR Infrastructure
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Chennai 17,
India 600 017

Website
kmrinfrastructure.com

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+91-94450-35832

Moser Baer Solar

Moser Baer is a global technology company providing storage media products, Photovoltaic and home entertainment.

Moser Baer Photo Voltaic Limited (MBPV) and PV Technologies India Limited (PVTIL) are subsidiaries of Moser Baer India Limited. These entities were launched between 2005 and 2007 to manufacture solar modules and design EPCs for deployment of PV System (solar farms, rooftops and off grid applications).Today the company is present in 82 countries. Moser Baer owns its own PV production facility and raised 93.5 USD Million of funds in 2008 for its PV business. The company spent resources on the development of thin film technology with the commissions first of its kind 1 MW Thin Film solar farm in Maharashtra. The company had an overall income of 187 Rs in lacs in year ending 31st March 2011.

Project Locations

India, Global

Latest Press Releases

October 2010 - Moser Baer India awarded MNRE grant for the development of an innovative CIGS solar cell technology

http://www.moserbaersolar.com/media-press-details-oct27-10.asp?links=me2a

Moser Baer India (MBI) has been awarded a grant by the Ministry of New and Renewable Energy (MNRE) to engage in the developmental activity of Copper Indium Gallium Selenide (CIGS) solar cells.

Company
Moser Baer Solar
43B, Okhla Industrial Estate, New Delhi - 110020.
India.

Website
moserbaersolar.com

Telephone
+91 11 40594444

Reliance Solar

Reliance Solar is developing and offering a range of products, systems and solutions- from solar lanterns, home lighting systems, street lighting systems, water purification systems, refrigeration systems to solar air conditioners - all based on solar energy. Partners include BSNL, ITIL.

Project Locations

India

Latest Press Releases

Not Available

Company
Reliance Solar Group
Building No. 5C,1 st Floor,
Reliance Corporate
Park,Thane- Belapur
Road, Ghansoli, Navi
Mumbai 400701, India

Website
relsolar.com

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+91-22-44770000

Sun Edison

SunEdison is developing and operating hundreds of solar plants throughout the world, representing 100.6 MW of clean photovoltaic (PV) capacity.

Project Locations

Indian Subcontinent, East Asia, Middle East and South East Asia

Latest Press Releases

May 2010 - SunEdison, an MEMC Company, and First Reserve Announce Joint Venture to Fund Up to $1.5 Billion of Solar Energy Projects

http://www.sunedison.in/press_releases.php?id=96

SunEdison, the solar energy development division of MEMC Electronic Materials, Inc. (NYSE: WFR), today announced an agreement with First Reserve Corporation to establish a joint venture which could provide for the acquisition of up to $1.5 billion in current and future SunEdison solar photovoltaic energy projects.

SunEdison is one of the world's leading solar project developers, with more than 350 solar electric power plants constructed and under management. First Reserve is one of the world's largest private equity and energy infrastructure investors, with $20 billion under management.

Company
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Vadki Village, Pune
- 412 308, INDIA.

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sunedison.com

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Tata BP Solar

Tata BP Solar is a joint venture of BP Solar (51%) with Tata Power (49%). Tata BP Solar has played an active role in developing the Indian solar market over the last 20 years during the phase when only off-grid products such as solar lanterns and home lightings systems and solar street lights could be sold in India. The company has established rooftop and free field solar power plants and megawatt-scale grid connected solar power plants in Germany, Spain, USA, Australia and Italy.

The company has a cell manufacturing capacity of 84 MW and module manufacturing capacity of 125 MW.

Project Locations

India

Latest Press Releases

March 2011 - Tata BP Solar Receives FICCI Annual Award 2008-09 From India Finance Minister

http://news.oneindia.in/2011/03/03/tata-bp-solar-ficci-annual-award-2008-09-aid0102.html

Tata BP Solar added another feather to its cap as the Union Finance Minister, Mr Pranab Mukherjee, presented the company with the "FICCI Annual Award 2008-09 for Outstanding Achievement in Environmental Sustainability of Business" at the 83rd Annual General Meeting of the Federation of Indian Chamber of Commerce and Industry (FICCI) on Tuesday 01 March 2011.

April 2010 - Tata BP Solar Expands Solar Manufacturing Capacity by 62% to Serve Growing Solar Market in India

http://www.tatabpsolar.com/news.php?k_id=Tata-BP-Solar-Expands-Solar-Manufacturing-Capacity-by-62--to-Serve-Growing-Solar-Market-in-India

August 2009 - NXP Semiconductors today announced a development partnership with Tata BP Solar India ltd, a joint venture of BP Solar and Tata Power, under which Tata BP intends to use various electronic solutions for solar applications developed by NXP. These solutions have been developed by NXP as per the requirements of Tata BP. Both companies are looking at a long-term partnership that will see the development of a range of products.

http://www.solarfeeds.com/pcs-solar-photovoltaics-blog-/8423-tata-bp-solar-nxp-co-operate-to-develop-solar-solutions

Company
Tata BP Solar
Plot No.78, Electronic City
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Bangalore 560 100 India

Website
tatabpsolar.com

Telephone
+91 80 4070 2000

Vikram Solar

Vikram Solar manufactures a wide range of Solar modules made with high efficiency multi / mono crystalline solar cells for both commercial and domestic use.

The company also undertakes EPC contracts for private/government sectors on large and complex Solar PV Power projects. It has its own PV manufacturing facility and in house System Designing at its factory in Falta, West Bengal. Vikram Solar has a strong in-house R&D team that is continuously evolving new technologies to increase the module efficiency. It has a tie- up with BESU (Bengal Engineering & Science University) in Kolkata, and strong relation with various major technology providers.

Project Locations

Asia, Europe, USA, Africa

Latest Press Releases

May 2011 - Vikram Solar Plans Major Thrust towards Solarization of Telecom Towers

Vikram Solar Private Limited, one of the premier companies in India for the promotion of renewable energy and its implementation, has decided for a major initiative towards solarization of telecom towers. Vikram Solar manufactures a wide range of Solar modules made with high efficiency multi/mono crystalline solar cells for both commercial and domestic use. The company also undertakes EPC contracts for private/government sectors on large and complex Solar PV Power projects. It has its own PV manufacturing facility and in house System Designing at its factory in Falta, West Bengal. In-house manufacturing of PV modules helps the company to keep control over the cost and quality.

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XL Telecom & Energy

XL is a Solar End-to-End solution provider with its solutions extending from Solar Cell Manufacturing to SPY Modules to Turnkey Systems Integration for Solar Farms.

XL, through its subsidiary, established 1.6 MW Solar Farm in Europe in October 2008, the first Company globally to capture the complete Solar value Chain for Solar Cell to Energy Generation with total investment of Euro 10.3 Million which is making profits since then.

Project Locations

India, Europe

Latest Press Releases

2007 - XL Telecom & Energy Bags worth of Rs. 235 Million BSNL order
XL TELECOM & ENERGY LTD, a leading global Solar Energy focused company, received ORDERS VALUED Rs.235 Millions for supply of Solar Photovoltaic Power Systems to Bharat Sauchar Nigam Limited (BSNL)i The order involves supplyiof complete Solar System for Telecom Applications.

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Delta Group

The Delta Group is the world's leading manufacturer of switching power supplies and DC brushless fans, as well as a major supplier of power management solutions, components, visual displays, industrial automation, networking products, and renewable energy solutions. Our mission is to provide innovative, clean and efficient energy solutions for a better tomorrow.

Client List

Vodafone Turkey
Mail.ru
Orange Poland
Togocell
Etisalat MISR
Saudi Telecom
Motorola/NSN
MTN Networks
Maroc Telecom
Mobilink Pakistan
Qtel Group
Zain Group
Mobinil Egypt
Mobily Saudi (Etisalat Saudi)
Saudi ITC

"The key reason for choosing Delta was its wide product range. A total solution not only makes life easier but also enables significant cost savings."
Vodafone Essar.

Energy Management

We revolutionize telecom power market standards by bringing energy efficiency to the system level. Our cutting-edge control and monitoring solutions include the most efficient power conversion modules, cooling options and renewable energy sources in the market. Thanks to our broad product portfolio and global resources, we can provide our telecom customers with highly efficient, total power solutions.

RenE solutions use renewable energy or a combination of renewable and other energy sources, such as mains power or diesel generators. Renewable energy sources ensure reliable telecom services in areas where mains power is unreliable or unavailable.

Delta's EnergE rectifiers are an efficient and sustainable solution to power conversion. They set a new standard in energy efficiency: many models meet the highest energy-efficiency standards of up to 95% or more. The plug-and-play EnergE rectifiers can also be installed as an upgrade to your existing system.

DELTA

Available in different configurations, Delta OutD cabinets are designed to protect equipment from external threats in all climates from the tropics to the arctic. In addition to traditional cooling methods, Delta's new hybrid cooling options revolutionize the cost structure of thermal management. For systems designed for EMEA and SA, Delta has developed two new hybrid solutions. Both hybrid systems, a combination of AV+AC and a combination of HEX+AV, lower operational as well as capital expenditure.

In the EMEA region, Delta is headquartered in the Netherlands and has operations in 17 countries.

Geographic Footprint

Worldwide.

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BS Transcomm

BS TransComm Limited (BTL) was incorporated in 2004 and is headquartered at Hyderabad. The company provides end-to end solutions which include tower manufacturing, turnkey services, managed services and technology solutions for power transmission and telecom infrastructure. The company has two tower manufacturing facilities, at Medhal and Mechal in Andhra Pradesh.

As of June 2010, the company had 1,011 permanent employees and 780 contract employees. BS TransComm offers its customers alternate energy solution via Solar & Wind Hybrid Energy Solution which reduces the operational costs, specifically energy costs, of running a telecom cell site. BSTL's deployed a pilot of a solar and Wind Hybrid Solution for Telecom Cell Site which helps in reducing the dependency on diesel consumption and runs effectively using natural resources of solar & wind. BS TransComm offers a wide range of remote monitoring and control solutions to its customers through products developed by Sugan automatics private limited. The key clients of the company include Aircel, Idea, GTL, Essar, Indus Towers, Reliance Communications, Tata Indicom, etc.

Project Locations

Eight regional offices to service all 23 telecom circles in India and six project offices to service customers in the power sector.

Latest Press Releases

October 2010 - BS Transcomm to earn Rs 200 crore from green energy business
Hyderabad-based BS transcomm engaged in providing towers to telcom and power transmission companies expects its off-grid renewable energy solutions business to contribute Rs 200 crore over the next 10 years. "We have received an LoI (letter of intent) from Zamil New Delhi Infrastructure for 500 green energy sites, which will be installed in the next six months by our subsidiary Sugan Automatics," Rajesh Agarwal, Managing Director of BS Transcomm told reporters here today.

Agarwal said that the company had tied up with Tata BP Solar for the solar panels, and is currently in talks with companies like Indus Towers, BSNL and MTNL.

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ACME

ACME is a solar power company providing solutions for both thermal and photovoltaic technologies. ACME started their telecom business in 2003 with the goal of improving the energy efficiency of tower BTS. They presently have 500 million in annual turnover with 100 million in profits in 2009. Previously they have been focused primarily on the Indian market, but now have a footprint in 5 African countries, with their wholly owned subsidiary Reime NIS Company. They see an expansion into Africa as significant, as larger players such as Bharti buying Zain are looking to consolidate and potentially bring the tower model to Africa.

ACME has as good relationship with Bharti in India, and relayed to me off the record, that ACME supplies 70-80% of the passive equipment in Bharti towers across India. ACME is among the main solar providers in India and has deployed approximately 100 turnkey solar sites using the PPA model and has a backlog of 1500 sites, with each site having load range from 5-6kW. Clients include Airtel, Vodafone, IDEA, Safaricom, Tata Indicom, Reliance Infocomm, Indosat, GrameenTelecom.

Project Locations

The company is currently focusing on nine telecom circles: Uttar Pradesh (East), Uttar Pradesh West), Madhya Pradesh, Maharashtra, Karnataka, Tamil Nadu, Bihar, Assam and Andhra Pradesh.

Latest Press Releases

January 2011 – "ACME Telepower ltd shortlisted for "Green Mobile Award for Best Green Product/Service or Performance" category by GSMA (Mobile World Congress 2011)

http://www.acmetelepower.com/download/GSMA-nomination-jan-19-2011.pdf

September 2010 – "ACME Tele Power ltd becomes key solar power supplier to Grameenphone". ACME Tele Power ltd (ATPL) has signed an agreement with Grameenphone ltd, the first telecom company in Bangladesh to have deployed solar power on large-scale under power purchase agreement. Under its agreement with Grameenphone ltd, ATPL will be responsible for installation and maintenance of solar panels in Grameenphone's Base Transceiver Station (BTS) premises. Grameenphone will buy electricity on unit (Kwh) consumption basis for a contract period of 10 years, with a buy-back option after that period.

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Alcatel Lucent

Alcatel Lucent AL is one of the biggest telecom equipment providers worldwide; the company focuses on fixed, mobile, and converged networking hardware, IP technologies, software, and services.

AL is providing its renewable energy products under the Alcatel Lucent's "Green Touch" initiative, which aims to reduce the emissions produced by networks a thousandfold. This initiative was launched in January 2010, including several major network operators, including China Mobile, AT&T, Portugal Telecom and Swisscom, and a host of research institutes and component manufacturers.

Project Locations

Global

Latest Press Releases

May 2009 - Bharti Forms India Telecom Alliance with Alcatel-Lucent

http://www.businessweek.com/globalbiz/content/may2009/gb2009051_422522.htm

Bharti Airtel has entered into a joint venture with Franco-American telecom gear maker Alcatel-Lucent to manage its landline and broadband business, expanding its tested strategy of outsourcing technology functions to focus more on marketing and sales.

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Alcatel Lucent
14th & 15th Floor
Tower C, DLF Cyber
Greens DLF City, Phase III
Gurgaon 122002,Haryana

Website
alcatel-lucent.com

Ericsson

Ericsson is the biggest worldwide provider of mobile telecommunication equipment and data communication systems, and related services, covering a range of technologies, including especially mobile networks. The company has been working to reduce and optimize their BTS consumption over the past years, added to other initiatives such as Community Power in Africa.

AL is providing its renewable energy products under the Alcatel Lucent's "Green Touch" initiative, which aims to reduce the emissions produced by networks a thousandfold. This initiative was launched in January 2010, including several major network operators, including China Mobile, AT&T, Portugal Telecom and Swisscom, and a host of research institutes and component manufacturers.

Project Locations

Global

Latest Press Releases

May 2011 - Ericsson wins 'Excellent initiative towards green technology' award in India

http://www.ericsson.com/news/110512_award_india_244188810_c

Federation of Indian Export Organizations (FIEO) has awarded Ericsson with the "Excellent Initiative towards Green Technology" award at the 'Telecom Technology Awards'. The Telecom Technology Award is organized for the first time by FIEO to honour companies who are contributing by bringing in innovation and promoting efficiency in communication technology. Ericsson has been recognized for its sustainable and green solutions that aim to enable a low carbon economy by making the networks more efficient in terms of energy consumption. Ericsson solutions such as Smart Site, MSC-S Blade Cluster server, GSM RBS 2111 Main Remote, Network Energy Optimization , BTS Power Saving Feature, Bio-fuels and Tower Tube were recognized as industry leading innovations in this field.

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Huawei

Huawei is one of the largest networking and telecommunications equipment company headquartered in Shenzhen. It is estimated to be the second-largest supplier of mobile telecommunications infrastructure equipment in the world (after Ericsson). Huawei recently announced the next five years will be $2 billion investment in India, used for research and development, manufacturing, and development for the Indian market products.

Project Locations

Global

Latest Press Releases

December 2010 - Huawei turns focus on India
On the eve of Premier Wen Jiabao's India visit last week, Chinese telecommunication giant Huawei Technologies announced a $2 billion (around Rs.9,000 crore) investment in India over the next five years, clearly indicating how serious it is to tap the hidden potential of the Indian telecom sector. Though the Chinese telecom equipment giant has been in India for the past decade, it is now giving clear indications to its European competitors that the race ahead would be no cakewalk for them.

For the next five years, Huawei would largely focus on the Indian market, which is all set to witness another boom with Indian telecom operators launching an array of 3G mobile services and hi-speed wireless broadband.

Apart from expanding its reach in India by opening offices in new locations, Huawei India will be expanding its R&D capabilities at its Bangalore centre and also starting production at its upcoming plant near Chennai. Significantly, the current Bangalore R&D centre is already the biggest such facility for the company outside China.

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Huawei
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0091-022 39580808

Nokia Siemens Networks

Nokia Siemens Networks (NSN) is one of the biggest telecom equipment providers worldwide. The customer base of Nokia Siemens Networks includes 1,400 customers in over 150 countries (including more than 600 operator customers).

The Delhi and Bangalore NSN Hub are among the biggest for the company. NSN will also establish a new facility at Navalur in Chennai in addition to the existing facility at Taramani as part of its global network solutions center (GNSC). Nokia Siemens Networks is also committed to manufacture 3G products locally, at its Chennai facility.

Project Locations

Global

Latest Press Releases

May 2010 - Nokia-Siemens to source components from India

http://www.business-standard.com/india/news/nokia-siemens-to-source-componentsindia/394388/

Telecommunication equipment major Nokia Siemens is planning to source components worth Euro 500 million, an increase of around 50 per cent compared to last year. Meanwhile, the company has developed renewable energy solutions for telecoms operators. The solution would help the operators to handle frequent power cuts in rural parts of India and will reduce the operating cost, according company's senior official.

NSN also developed a range of energy solutions for telecoms operators. The energy solutions, designed to reduce network operating costs, can lower the power consumption of telecoms networks by exploiting more efficient technology and renewable energy, said Samar Mittal, Head of Global Services Sales at Nokia Siemens Networks India. He added that Nokia Siemens Networks Energy Solutions include energy saving site solution products, renewable energy products include solar panels, wind turbines, battery banks and others.

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Power Oasis

PowerOasis is a UK based company providing turnkey, off-grid power solutions for operators of mobile phone base stations. We offer a unique combination of expertise in renewable energy and mobile telecommunications.

PowerOasis have established themselves as innovators in combining the needs of mobile telecommunications companies with the latest advancements in tier 1, telco grade renewable systems. 2010 marked a new chapter for PowerOasis rollouts with a 200-site deployment in South East Asia, which has underlined the substantial cost savings that can be made with their unified, equipment agnostic wireless network power management solutions. The contract was for a combination of green field, retrofit, on-grid, off-grid and unreliable grid. The PowerOasis Controller (D) is used for smart generator-battery hybrid power management supplemented by solar energy on a selection of sites

Project Locations

Global

Latest Press Releases

June 2011 -PowerOasis Opens New Asia-Pacific Office

http://www.power-oasis.com/webmanager/news_25.html

Reacting to strong demand for its wireless network power management solutions in the Asia-Pacific region, PowerOasis is pleased to announce the strengthening of its local presence with a new office in Singapore. John O'Donohue, Chief Executive Officer for PowerOasis explains; 'Our new Singapore presence means that we can provide timely support and strong local knowledge to benefit customers in the Asia-Pacific region. Our wireless network power management solutions are well proven as demonstrated by a recent 200-site hybrid power solution roll-out for a South East Asia operator. This operator is now benefiting from fuel savings, reduced site visits, fewer power related trouble tickets and improved supply chain management.

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United Kingdom

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Luminous Renewable Energy Solutions (former UD Energy)

UD Energy Systems (P) Limited is now a part of the USD 150 Million Luminous Power Technologies ltd Group.

It is engaged in design, manufacture, supply, installation and servicing of all types of Wind-Solar, only Wind and only Solar photovoltaic power plants. UD Energy Systems have a strong technology base for delivering remote power solutions. Its team of engineers and technicians are experienced in wind solar hybrid design, system integration and installation.

Project Locations

Indian Subcontinent, East Asia, Middle East and South East Asia

Latest Press Releases

June 2011 - Schneider Electric buys 74% stake in Luminous Power
French firm Schneider Electric said on Tuesday that it will invest Rs 1,400 crore to acquire a 74 per cent stake in the country's Luminous Power Technologies Private ltd, which is engaged in providing inverters, UPS and power storage systems for homes and small and medium-sized businesses. Luminous employs approximately 3,000 people in eight different industrial sites in India and one in China. It generated revenues of Rs 1,100 crore for the financial year ended March, 2011, it said.

Company
Luminous Renewable Energy Solutions (former UD Energy)
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Vadki Village, Pune - 412 308, INDIA.

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windsolarzone.com

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Bergey WindPower

BWC provides complete design, supply, and installation services for hybrid power systems utilizing wind turbines, diesel generators and photovoltaic arrays.

Bergey is involved in the Telecom and the global rural electrification sectors. In India the government is using 20 kW wind system packages, using two of their 10 kW units, to bring electricity to villages far from the utility grid. Jengging village, Arunachal Pradesh, which is in the foothills of the Himalayan Mountains, for example, was electrified with wind turbines in 1988.

Project Locations

Global

Latest Press Releases

Not Available

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Unitron Energy

The main strength of the company is manufacturing and development of various types of New Generation Power Conditioning & Power Conversion equipment such as U.P.S., DC-DC Converters, Inverters, and Charge Regulators VFD Drives etc.

Few years back the Company diversified into foray of Renewable Energy Systems, such as small wind energy, which is still at a nascent stage in our country, especially the concept of 'MICRO WIND'.

Project Locations

India, EU, Africa, USA, Far East

Latest Press Releases

Not Available

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Zephyr Corporation

Established in 1997, Zephyr Corporation is a privately owned company which is headquartered in Japan and has offices in Sweden, USA and Dubai. All development and manufacturing is done in Japan from Japanese materials. More than 4,000 of Zephyr Corporation's turbines have been installed worldwide. Zephyr is an expert in wind turbine products.

With a diameter of just 1.8 metres and weighing only 17.5 kg thanks to ultralight blades made from carbon fibre, Zephyr Corporation's turbines are able to generate power at the lowest wind speed of any turbine on the market today – from just 2.5 m/s (5.6 mph). They can be used at both off-grid and on-grid sites; either for new base station deployments; or for retrofitting of existing base stations.

Project Locations

Global

Latest Press Releases

October 2010 - Turkcell Using Zephyr Corporation's Wind Turbines To Power Off-Grid Base Stations

http://www.zephyreco.co.jp/en/news/2010/10/21/turkcell_using_zephyr_corporat.html

Zephyr Corporation today announced that Turkcell is using its wind turbines to power off-grid sites in the Izmir, Antalya and Adana provinces of Turkey. The eleven turbines are being used to power seven Ericsson GSM base station sites which are located in areas not covered by the electricity grid and supplement the solar panels and diesel generators already in use. Mr. İlter Terzioglu, Turkcell's Chief Technical Operator (CTO) who is responsible for network operations, said: "Turkcell is a pioneer in the the adoption of environmentally-friendly technology including wind turbines. Turkcell is already saving energy equal to the annual need of 315 households with the energy produced via alternative sources. With the other saving methods utilised in base stations we are expecting annual 13.2 milion Wh reduction in total consumption. This corresponds to the energy use of a family of four for 165 years".

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