Light Fidelity, Light based communication is the Backbone of development and Power dependent nation

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***Abstract*—Wireless communication is the back bone of the development of Nation and the world. The advancement came all around the world in the field of business, agriculture, industry, education and research. The present paper has been able to prove the light fidelity is the backbone of development and power dependent nation.With the implementation of Li-Fi we may save the power dissipated by the BTS all over the country.**

Key Word: [BTS, BS, GSM, WLL, UE, CDMA, WLL, Wi-Fi, Wimax, WAN, RBS, Transceiver Station, Base Station, Duplexes

I. INTRODUCTION

A A base transceiver station (BTS) generally known as the BS is basically a wireless tower and may be defined as a piece of equipment that facilitates wireless communication between user equipment (UE) and a network. UEs may be termed as are the devices like mobile phones (handsets), WLL phones, computers with wireless Internet connectivity. The network can be that of any of the wireless communication technologies like GSM, CDMA, wireless local loop, Wi-Fi, Wi MAX or other wide area network (WAN) technology. BTS is also referred to as the radio base station (RBS), node B (in 3G Networks) or, simply, the base station

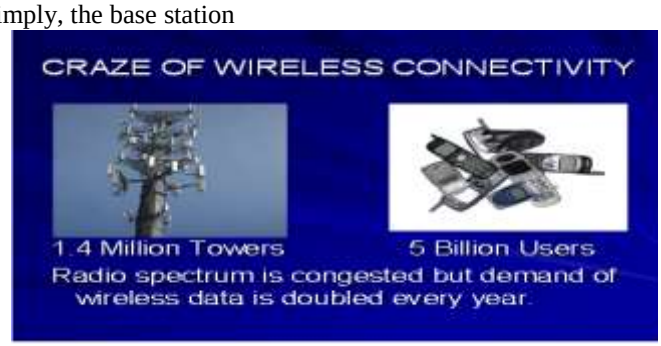


Figure-1.BTS.

A BTS (figure-1 shown above) consists of the following:

- Antennas that relay radio messages
- Transceivers
- Duplexers
- Amplifiers

Literature Study: Base Transceiver Station (BTS) holds the radio transceivers that define a cell and coordinates the radio-link protocols with mobile devices. BTS is the networking component of a mobile communications system from which all signals are sent and received and facilitates wireless communication between subscriber devices and telecom network. BTS comprises of a transceiver which handles transmission and reception of signals; sending and receiving of signals to or from other network entities; a combiner for combining feeds from several transceivers for sending via single antenna; a power amplifier for signal amplification; a duplexer for separating sending and receiving signals; and an antenna.

II. NUMBER OF BTS INSTALLED.

The number of BTSs installed at mobile towers in India was 1123368 as on 29.02.2016. There were 12 Licensed Service Areas with more than 50000 BTSs installed at mobile towers viz. Tamil Nadu, Maharashtra, Andhra Pradesh, Karnataka, Gujarat, Madhya Pradesh, Uttar Pradesh (East), Delhi, Bihar, Uttar Pradesh (West), Kerala and Rajasthan as on 29.02.2016.

The number of BTSs installed at mobile towers in Tamil Nadu was 100210 as on 29.02.2016. It had a share of 8.92% in the total number of BTSs installed at mobile towers in India as on 29.02.2016. The number of BTSs installed at mobile towers in Maharashtra was 95328 as on 29.02.2016. Maharashtra had a share of 8.49% in the total number of BTSs installed at mobile towers in India as on 29.02.2016.

The number of BTSs installed at mobile towers in Andhra Pradesh was 90986 as on 29.02.2016. Andhra Pradesh had a share of 8.1% in the total number of BTSs installed at mobile towers in India as on 29.02.2016. The number of BTSs installed at mobile towers in Karnataka was 85875 as on 29.02.2016. Karnataka had a share of 7.64% in the total number of BTSs installed at mobile towers in India as on 29.02.2016.

The number of BTSs installed at mobile towers in Gujarat was 70761 as on 29.02.2016. Gujarat had a share of 6.3% in the total number of BTSs installed at mobile towers in India as on 29.02.2016. The number of BTSs installed at mobile towers in Madhya Pradesh was 70695 as on 29.02.2016. Madhya Pradesh had a share of 6.29% in the total number of BTSs installed at mobile towers in India as on 29.02.2016.

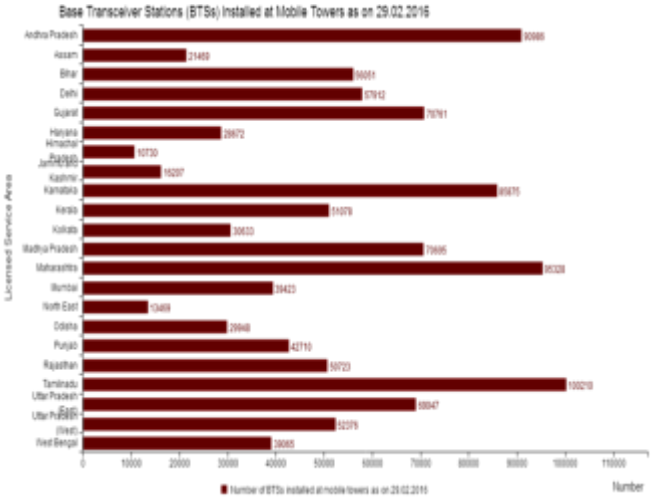
The number of BTSs installed at mobile towers in Uttar Pradesh (East) was 69047 as on 29.02.2016 (6.15% share in

All India). The number of BTSs installed at mobile towers in Delhi was 57912 as on 29.02.2016 (5.16% share in All India). The number of BTSs installed at mobile towers in Bihar was 56051 as on 29.02.2016 (4.99% share in All India).

The number of BTSs installed at mobile towers in Uttar Pradesh (West) was 52376 as on 29.02.2016 (4.66% share in All India). The number of BTSs installed at mobile towers in Kerala was 51078 as on 29.02.2016 (4.55% share in All India). The number of BTSs installed at mobile towers in Rajasthan was 50723 as on 29.02.2016 (4.52% share in All India).

S.No.	No of Tower	Total Power Dessipated
1.	1123368	INR 68,481

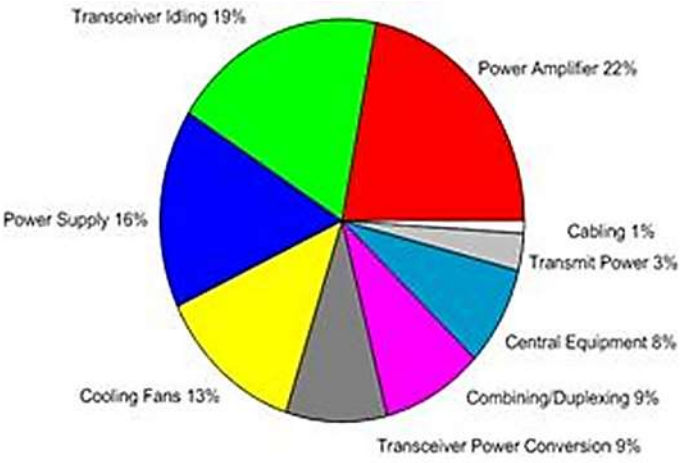
Energy costs at various sites Using the same calculation method as in the case scenario above, Exhibit 8 plots the cost of energy per month as a function of site power requirement and the number of hours of DG set is run. Running DG for 24 hours each day for a 7 kW load site might cost upwards of INR 102,252 per month. However, in reality the battery bank at the off-grid site may be adequate enough to support the load for a certain portion of the day thus reducing the overall cost of energy at a particular site. Exhibit 8: Monthly cash outflow at telecom site for variable loads The effects of diesel price increase To tackle subsidy burden and large deficits, the Finance Minister of India has pegged the fuel subsidy burden8 for 2012-13 at INR 43,580 Crore, compared to INR 68,481 Crore in the revised estimates for this financial year renewable solutions to overcome the challenges faced by the economy and environment due to increased diesel usage. To come up with an optimal solution, it is essential to explore different alternative solutions.



(Fig-2 No. Of BTS Installed 29 feb 20116)

India is witnessing a phenomenal growth in the telecom sector for the past many years with average monthly addition of 15-18 million subscribers. The teledensity, which was less than 3 % a decade ago, has increased to 73.11 %. As per TRAI, India has 840.28 million wireless subscribers out of a total telephone subscriber base of 874.68 million, as on 31st May, 2011. We have 12.12 million subscribers in wireless networks. Remote areas of the country that have no roads, grid-electricity, landline telephones or gas still receive network from one or more telecom companies. However, the Base Transceiver Station (BTS) that these companies used in Off-grid areas are dependent on on-sight diesel generator and the frequent maintenance refueling that this entails.

The mobile towers are always found to be in active mode (24x7) which results in higher rate of energy consumption throughout its usage.Base Transceiver Stations (BTS) consumes around 2% of the total power production in India and this 2% is consumed by only 30% of the towers which are connected to grid. Tower companies in India consume ~2 billion liters of diesel which is around 3.5% of total diesel consumption in India, next only to Railways. It is estimated that over 1.7 million tons of CO2 are released into the atmosphere by more than3, 00,000mobile towers located across the country. 70 % of these towers are in rural areas i.e. off grid area.



(Fig. 3 Depiction of 60% power consumption from BS)

Tower companies also have to incur expenses related to security of the cell site due to pilferage of diesel which is as high as 15-20% of total diesel consumption by tower companies. Apart from this, these generators entail transportation and storage of diesel which is a major problem in remote and hilly areas.

The capital cost of hybrid renewable powered system for a BTS is 50% more than one using diesel. However, if we use 9% cost of capital the renewable power system will recover the invested capital in less than six years. According to the reports by World's Resource institute, the benefit of using renewable energy solution can be measured in terms of cost factor and risk management. Switching to renewable energy is the way a corporation can signal to shareholders and institutional investors that it is mitigating climate related

risk. Major corporations like Johnson and Johnson, FedEx, General Motors (GM) to name a few, now are obtaining their electricity from renewable sources including solar and wind.

The individual footprint of Radio Access Network and Core Network will depend upon the type of BTSs and core network elements, their capacity and power consumption requirements. It will also depend upon design and manufacturing technology and power efficiency of the deployed systems.

The maximum power is consumed by the Radio access network, which includes the Microwave & BTS. It is safe to assume that more than 90% power is consumed by the Radio Access part & just 10% is consumed by the Core network.

The individual carbon footprint in case of mobile Radio Access Network and Core Network are:

a. **For Radio Access Network:** Energy consumed by the network equipment like BTS, BSC and the infrastructure to maintain these elements. A macro BTS site in (2+2+2 config), with 20 W TRX output power typically consumes about 3.0 KW including Air-conditioners, Power plant, feeder loss etc.
b. **For Core Network**: Energy consumption associated with core network equipment / elements like MSC, Data Centers, VAS equipment, etc.

With the onset of 3G, there will be a huge transition from voice to data applications and increased NGN services. Using 3G technology, operators are likely to step up the peak data transfer offered to consumers, which will necessitate more cell sites for the 3G coverage. It is expected that this will increase the power requirement as against 2G systems. The situation may become worse in 3 to 4 years since the new technologies will be deployed in that period.

one diesel generator consumes approx. 2 Ltrs of diesel per hour. Considering running generator for 12 hrs a day, means 24 Litrs of diesel per day. As per the existing cost of diesel fuel (37.75 per litre), total expense per tower per day would be approx. Rs. 900/-. Therefore if renewable energy sources are considered, the minimum saving would be about. 900/- per day and accrued saving in a year can be estimated about Rs. 3,24,000 per year per tower (900 x 30 x 12). Apart from this, regular maintenance expenses can also be saved substantially.

III. CONCLUSIONS

The total cost of energy to operate a telecom site is major cause of concern for Telecom Tower Infrastructure Providers. The rising operating costs, the logistical issues, the deregulation in price in the near future and the environmental cost of using diesel, all together are pushing the telecom industry to look for alternative solutions. The government is encouraging renewable solutions to overcome the challenges faced by the economy and environment due to increased diesel usage. To come up with an optimal solution, it is essential to explore different alternative solutions.

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