

Green Power for Mobile, **Telenor Pakistan**

Pakistan’s Energy Update

- The country's dependence on oil and gas to meet its primary energy needs amounts to an astounding 83.8 percent, while the share of hydro, coal and nuclear energy is merely 11 percent, 4.6 percent and 0.2 percent, respectively
- Pakistan's current energy crisis, coupled with a drastic reduction in the Chenab river's water after the commissioning of Baglihar Dam (India), has become the nation's worst nightmare.
- The business sector is suffering with 8 to 10 hours of complete electricity shutdown that has increased the OpeX massively
- Focus of the government is still on Hydro units as per WAPDA vision 2025, and no attention given to other alternate energy solutions i.e. Wind and Solar
- Due to this approach of the government, meager efforts of the Alternate Energy Development Board (AEDB) aimed at harnessing wind energy are set to be reversed
- Many investors had even got land allotted for installing wind energy farms, but delay on the part of the National Electric Power Regulatory Authority (NEPRA) in deciding the tariff has been a major hurdle in the takeoff of these projects
- With increasing tariffs and mounting installation costs, the interest of investors is waning

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Impact of Energy Crises

- Due to energy crises, use of genset is increased which has increased the Opex of our business.
- Usage of genset has increased the health concerns i.e. environmental pollution.
- Complaints of Public Nuisance has also increased due to the increased usage of genset.
- Increase in Opex has reduced our expansion plan in the rural areas.
- It is getting difficult to distribute diesel in time to keep our system running and becoming a huge problem to provide uninterrupted service

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Untapped Resources (Fact Sheet)

- For environmental and commercial reasons, the **answer lies in the solar and wind energy, potential for both of which has exceeded Pakistan's expectations**

WIND

- Wind Power Potential Survey of Coastal Areas of Pakistan was conducted by the Pakistan Meteorological Department in 2007. It estimates that the wind corridor in Sindh covers an area of about **9,700 square kilometers** and the gross wind power potential of the region alone amounts to 43,000 megawatts
- "Keeping in view the area utilization constraints, the exploitable electric power generation potential of the area is estimated to be about **11,000 megawatts**

SOLAR

- The sun shines between 8 and 8.5 hours daily, or approximately 3,000 hours p.a.
- Pakistan has a very good overall solar-energy potential. The average daily insulation rate in this region amounts to approximately 5.3 kWh/m2. Especially in the Province of Baluchistan the rate amounts to 6.0 kWh/m2

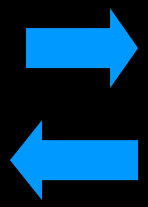
COAL

- Pakistan is fortunate to have one of the world's largest reservoirs of coal. The coal reserves in Thar, Sindh are 185 billion tons having worth of over US$ 25 trillion approximately making Pakistan the fifth largest in the world
- In NWFP the coal producing area is Hangu where resources are about 50 million tons but production is practically nothing. The situation in the province of Punjab is that there is a potential reserve of between 230-250 million tons while production is less than half a million tons.

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Going Forward – Bridge the competence Gap

- There is a need to advocate government to encourage the investment in Solar and wind projects
- Import of solar and wind solution shall be facilitated as import of diesel generators by exempting import duty
- Local manufacturers of solar and wind energy solutions shall also be facilitated
- All national and international stakeholders shall be on board to carve a strategy

National Stakeholders		International Stakeholders
Ministry of Water & Power AEDB NEPRA		USAID UNDP GSMA

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Gap Analysis

Current Scenario

- No plans in place for wind and solar energy
- No policy to encourage investment in energy sector

Drivers

- Country is going through enormous energy crisis
- Alternate energy solutions are the need of this time
- Environment friendly
- Cost effective

Barriers

- Mindset of the new government
- Red-tappism on the government part
- Lack of funding
- No local expertise

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GR Plan

Key Message

Alternate energy solution will help in overcoming the energy crises of the country, it will also help the Government to reduce the environmental pollution as the dependency on genset will be reduced. Further, it will increase the business activities and employment opportunities in the country. Foreign investment can also be attracted in the alternate energy field.

Expectations from GSMA

- Mobilize international Stakeholders to advocate the government in Pakistan on advantages of wind and solar energy
- Influence government for investor friendly policies in these sectors
- Facilitate the import of such equipment
- Necessary funding for such initiatives

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What We are Doing

We consider it to be our social responsibility to keep our environment healthy. This can be reinforced by the fact that we not only care about the occupational health and working environment of our employees but also our surroundings by strictly following the European quality standards as practiced throughout our network in Pakistan.

Alternative Energy Sources

Telenor is working on the prospect of deploying solar energy solutions to provide power to the sites in remote areas for avoiding continuous usage of Genset as a primary source of Power. This would minimize the emission from Genset and reduce environmental pollution.

Solar Electrical Energy Conversion System is an Alternative and renewable Source



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A view of components of Solar electrical power energy system









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Sun as Source of electrical energy

- Sun is immense source of heat energy which can be converted into electrical energy by using solar electrical energy conversion system.
- The Solar Energy is directly converted into electrical energy by using Photovoltaic cell.
- Only a few amount of sun energy is being utilized at earth while it can be increased to approximately 10,000 times of its present use.



Present Scope in Pakistan

Till 2007 importance of Solar electrical energy system was not considered in Pakistan due to

- Huge cost
- Lack of Solution Providers/Manufactures in Pakistan. While this year in 2008 due to
- Energy crises and
- Oil price Escalations in Pakistan.

It has been penetrating as one of the most important Alternative energy source in Pakistan as well.

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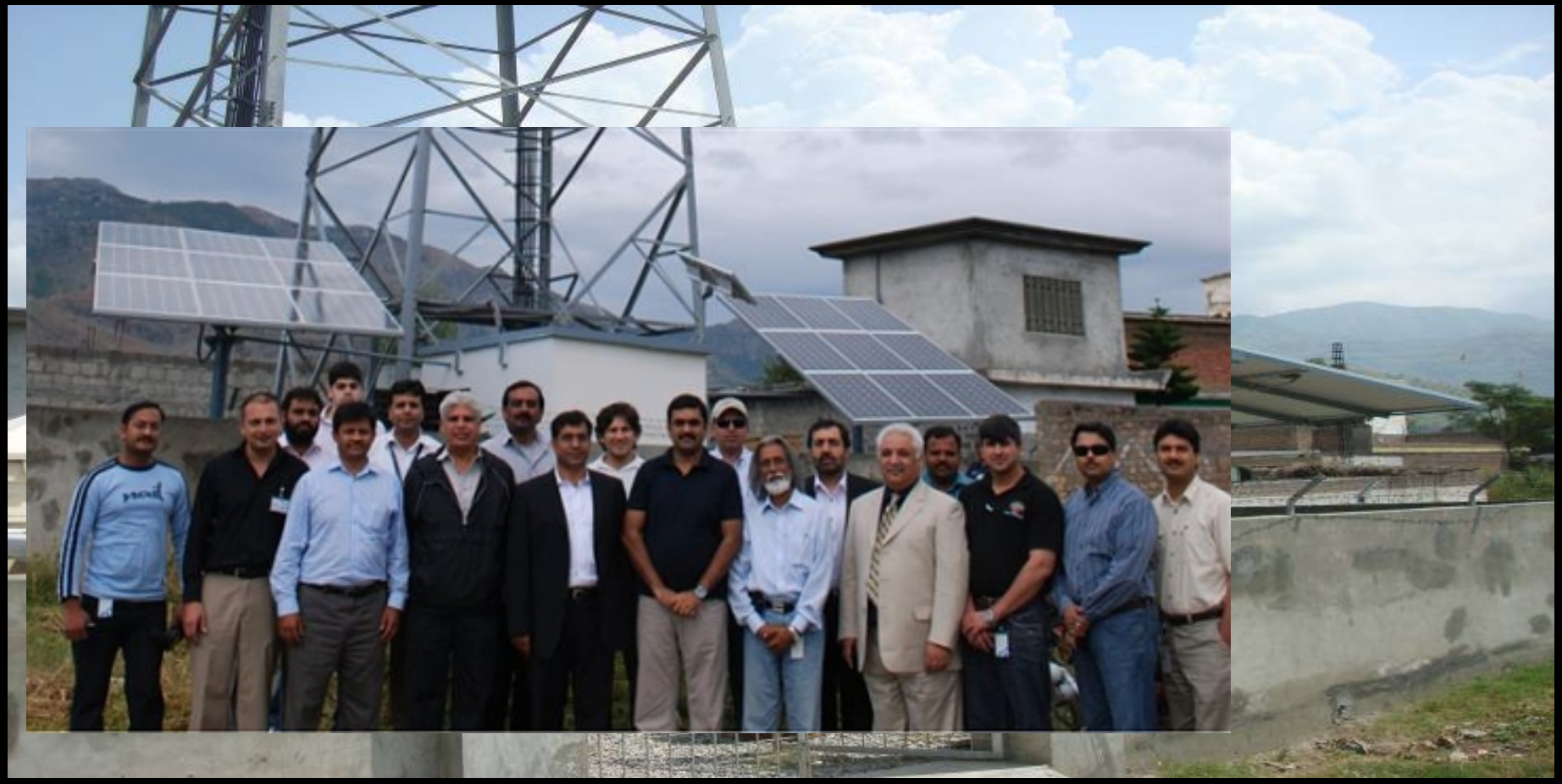
Installed solar electrical system design

- **Existing site didn't have Commercial Power and was running on dual Generators**

- Power requirement of test site IHV003.
  S222/222 Out door site,2000W.48VDC.
- Specifications of solar cells(260W/cell),
  28*260W=7280W.
- Battery bank with 50 hours backup time
  48V/2500 ah(72*2V/500ah parallel and series combination)
- Operational Hours Of solar system
  24 hours (Round the clock)
- Sun shine hours
  8 hours/day Approximately.

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INSTALLATION AT IHV003



FIRST SOLAR BTS SITE IN OPERATION

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Advantages of Solar system on others sources

- Non polluting, noiseless, no harmful unpleasant emissions of gases.
- Resource saving in terms of frequent corrective maintenance visits.
- Long Life of photovoltaic cells .

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Feasibility for GF/RT Sites

- Presently in our Network Almost 70 Percent of sites are GF and 30 Percent are RT.
- IHV003 is also a green field Site, selected as test Site for Solar energy power system.
- Due to the space/Structural feasibility requirements of the RT sites Solar system for Roof Top sites would be designed as site Specific.

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Solar Solution has taken off....



Thank You

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