



Second Green Power for Mobile 'Regional Special' Working Group – **Hosted by Safaricom**  
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## Vodafone Sustainability & Innovation in emerging market

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# The mission



# Stronger alignment with Vodafone Goals

## Our Sustainability Mission

**To be admired as a diverse and ethical company, operating responsibly and providing services that enable a more sustainable society for our customers**

### Our Goals

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**Leading communications company for responsible, ethical & honest behaviour**

**Leading communications company for eco-efficiency – doing more for our customers with less**

**Leading communications company for creating sustainable societies**

### Our Objectives

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- > Ensure Vodafone and our suppliers have an ethical supply chain
- > Deliver accessible products and services
- > Reduce our CO2 emissions by 50% by 2020
- > Be recognized as having the most customer-relevant sustainability initiatives in our industry
- > Establish joint CO2 reduction strategies with key suppliers
- > Build e-waste management capacity in key emerging markets
- > Deliver innovative products / services recognized as contributing to the Millennium Development Goals
- > Provide 10 million carbon-reducing M2M connections



**We need to deliver energy efficient products and services to  
address our ambition to be sustainable  
at every point in our business...**



# How to get the energy situation under control?

## Active Equipment (Radio)

Deploy more efficient radio solutions (RRH, single RAN, ..)  
Radio capacity 'sleep mode' during low traffic periods  
Ultra low consuming Radio solution Diet BTS for rural areas

## Design solution

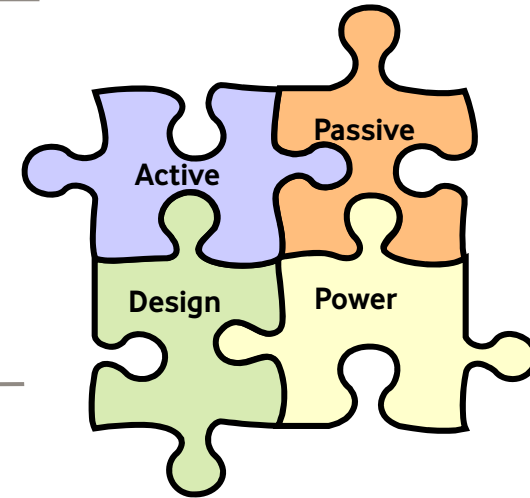
Design to real need  
invest prioritisation Vs site Revenue  
Intelligent control of energy consumption and diesel operation

## Passive Equipment (Site Infrastructure)

Free cooling solutions (remove the need for air conditioning)  
Increasing temperature set points to save cooling energy  
Standard (energy) efficient site Design: Cooling, Power, Batteries, Towers, Shelters, micro Cabinets, Cables,...

## Power solution

Green energy solution to support diesel consumption reduction in emerging market  
Bundling contracts with energy suppliers in EU  
splitting the costs with partners via active (RAN) radio sharing



Energy Efficiency has to be considered as a whole



# Some Facts: GPM Bi-annual report

## Energy Efficient and green technology solutions for network sites



Bi-annual Report November 2010



Ownership of diesel/battery hybrid is much lower than for solar/wind solutions. Alternating mode technology was therefore deployed to power more than 3000 base stations in the last 18 months and Vodafone now plans to roll it out further in particular in many of its base stations in Africa and India.

"As a part of our green energy initiatives we are currently deploying alternating hybrid solutions comprising of specially designed batteries and smart energy controllers with an inbuilt remote monitoring system on 2000 outdoor base stations. It has resulted in reduction of diesel generator run time by an average of 10 hrs/day/site thereby saving 50% of the diesel costs and substantial CO<sub>2</sub> reductions." Ashish Baldua - DGM - Network Commercial at Vodafone Essar

To increase energy consumption efficiency at the sites, real time measurements of diesel generators and battery backup hours are captured on a daily basis using a remote monitoring system. This also records annual diesel generator run hours and uncontrolled battery discharge time.

Figure 2: Battery as Main Power Source with Smart Energy Controller

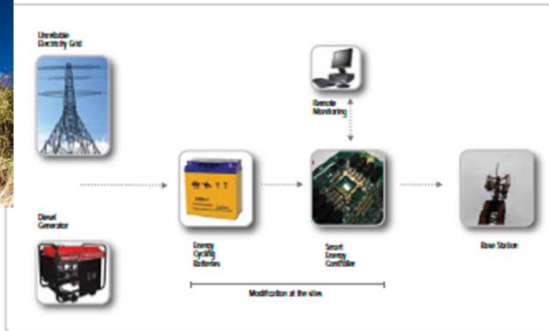


Figure 1: Alternating Mode: Smart Energy Controller & Cycling Batteries at VF-Essar Sites in India



alternating mode for 1.5kW base station, typically diesel generators run up to 10hrs at night where the power grid is unreliable:

Solution comparison		
	Hybrid Solution	Diesel Solution
	US\$10,000*	US\$14,000
IN)	US\$10,000	US\$38,000
Cost / India		
Investment varies according to grid power availability		
	Diesel (\$/year)	CO <sub>2</sub> (tonnes/year)
	1500-7500	4 to 13

\* according to grid power availability

From the alternating mode implementation, by using the diesel generator from sites able grid which was supported by diesel running from 2-0 hours per day. This has not only by reducing diesel consumption, but all the related maintenance costs.

### in Energy Sites

Vodafone has 104,344 (plus 93,946 for stations worldwide). More than 850 are now powered by renewable energy. It is anticipated that this number will increase

exponentially as we move out of the pilot phase. The anticipated reduction in diesel consumption was around 70% but renewable energy base stations have exceeded performance expectations on average by reducing consumption from anywhere between 80-100%. These base stations also play a key role in cost reduction reducing operating expenditure (OPEX) by about 50%.

Case study alternating mode for 1kW off-grid base station where typically diesel generator is the main power source:

Solution comparison		
	Solar Hybrid	Diesel Generator
	US\$38,000	US\$14,000
IN)	US\$38,000	US\$93,000
Cost / India		
	Diesel (\$/year)	CO <sub>2</sub> (tonnes/year)
Savings	9600	25
Payback	<1 year	

Source: VF Essar / India

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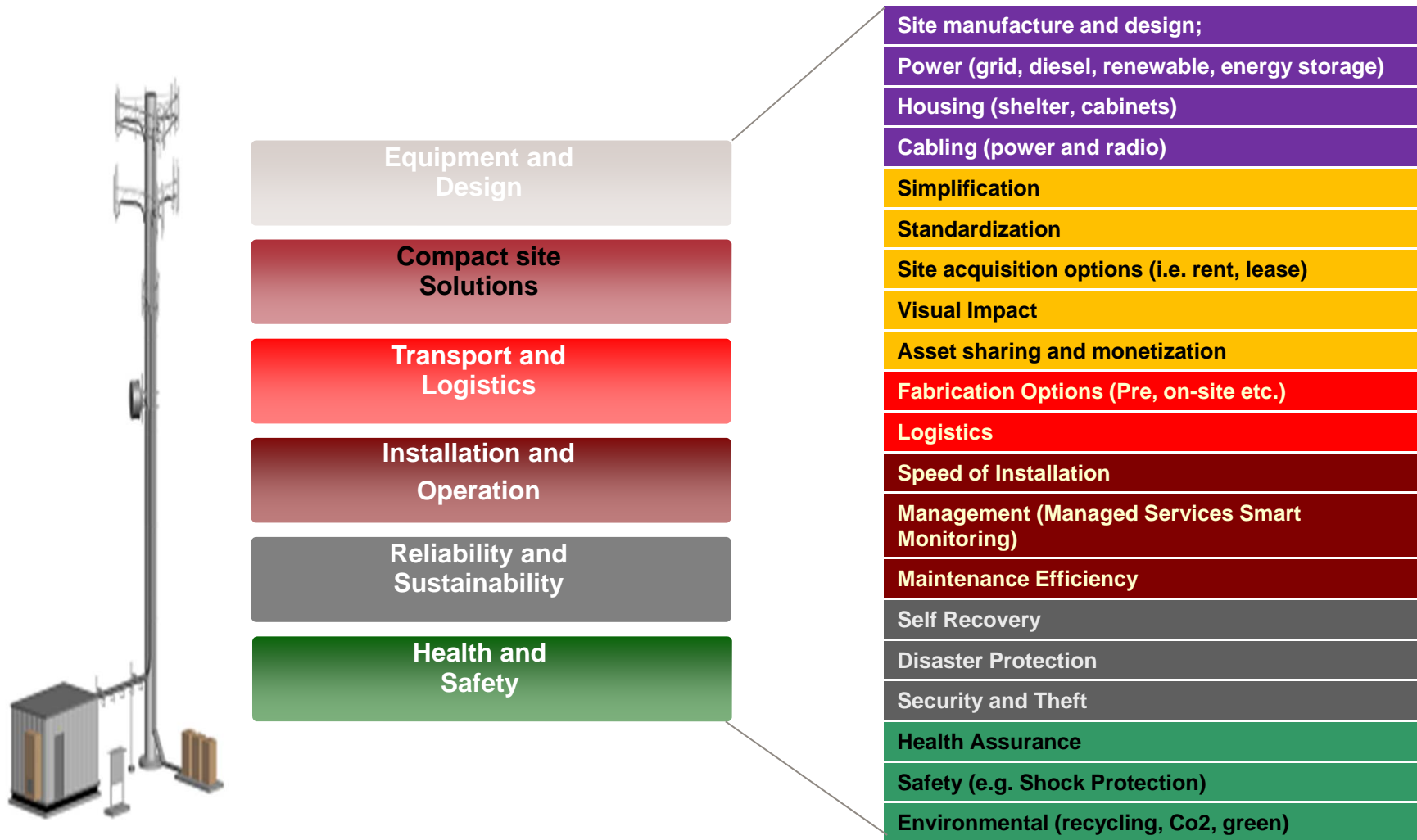


# Sustainability drives Innovation



# Innovation Scope

Innovative Design for Real Need





# Vodafone Site Solutions Innovation Centre in South Africa

Strong Focus on emerging market



## Innovation Centre

- > Centre of Excellence with Internal and Industry experts as CO2 free building powered with renewable energy and using innovative cooling and heating technologies
- > Area of Innovation to serve current needs from our market & to share best practice with our experts from the Group and Partner Markets
- > Area to show Innovative site solutions and related economic, social and environmental impacts

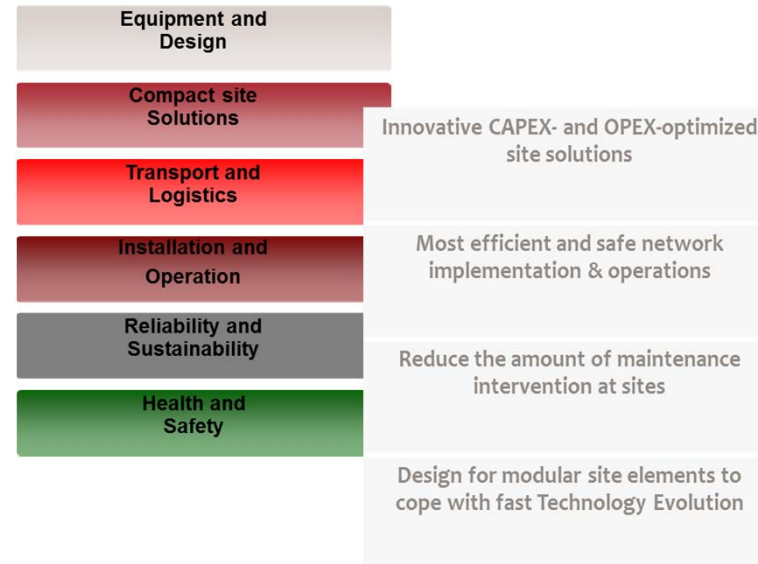


## Innovation Sites Test bed in Live Environment

- > Realize innovative sites to be used as best example for sustainable solutions/ideas
- > Area to pilot/trial new Innovative site solutions

## Innovation Scope

- > accelerate Time-to-Market for site innovation technology with best TCO, Deployment, Maintenance & Evolution
- > Focus on : compact site solutions, Transport & Logistics, Installation and Operation, Reliability & Sustainability, Health & Safety



# Use Innovative site solutions for driving community development



# Innovation is not only about Best TCO

Vodafone engagement in Community Power Projects

## Our Belief

- > Powering sites with renewables is the best sustainable solution where resulting excess of energy can be used for community power projects
- > Provision of power to the community will increase “ownership” of the assets and may reduce vandalism and theft
- > The first reasonable approach is to start with Handset and domestic Batteries charging for off Grid Communities



**We are pushing Pilots in different areas especially in India and Africa**

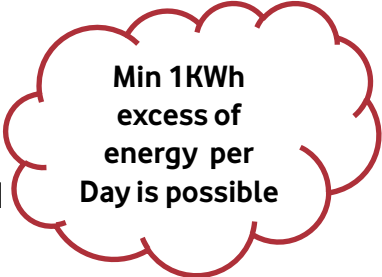
## Several approaches

- Charging points at base station.
- For distant villages : battery and phone charging solutions are provided direct to Customers

Design of solar solution according to real need :

Example of Site with 1,5KW basic load

- Power solution DG 8KVA
- 3 KWp solar solution
- Cycling Batteries 1200 AH
- Use of charging points for household batteries and handset ( supposing this is minor investment as this will be taken directly from the same DC bus powering the site)



**Min 1KWh excess of energy per Day is possible**

**What Could be the next reasonable approach?**



# Summary

- > Our Innovation Centre:
  - > Engage with professionals from Industry to drive Innovative site solutions at emerging market
  - > Green Solutions for network sites in rural areas are of strategic importance for our Company
- > Community Power Projects
  - > Expert Partners are welcome to share Ideas and Experience with our corporate responsibility people



# Thank you

