



Seventh Green Power for Mobile Working Group  
21-23 September 2010, Cebu, Philippines

## Vodafone way in energy efficient- & green site solutions

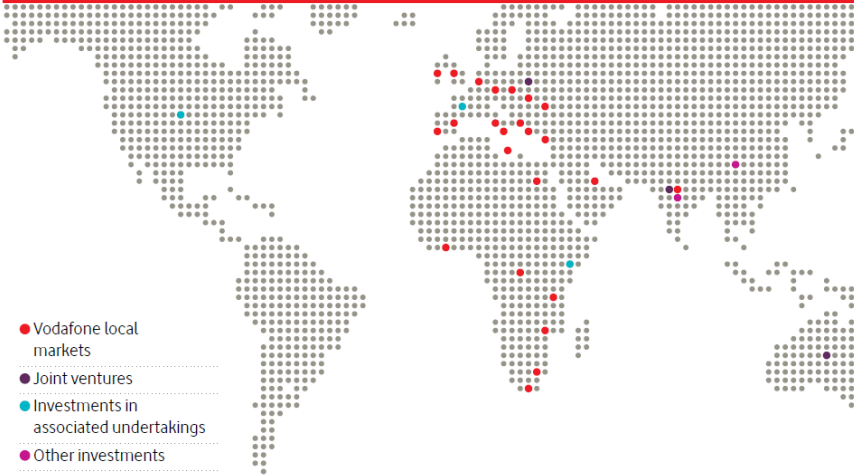
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Senior Manager Site Infrastructure & Energy  
Vodafone Technology Networks (VTN)



# Vodafone some facts

## Vodafone corporate relationships



What we do	
<b>Network</b>	
Total base station sites: <b>104,344 (plus 93,948 for India)</b>	
2G base station sites: <b>42,658</b>	
3G base station sites: <b>13,886</b>	
Co-located (2G and 3G) base station sites: <b>47,800</b>	
Total voice usage: <b>686,601 million minutes</b>	
Total SMS messages handled: <b>223.5 billion</b>	
<b>Products and services</b>	
New handset models released in 2009/10: <b>66</b>	
Vodafone branded devices, available in 31 markets including partner markets	
Smartphones accounting for 24% of handset sales in Europe	
Fixed broadband services offered in 13 markets	
4 netbook models with built-in 3G broadband launched	
<b>Brand presence and retail</b>	
Stores owned: over <b>2,100</b>	
Stores franchised: <b>7,600</b>	
Total Vodafone Passport customers: <b>24.9 million</b>	
Total Vodafone Mobile Internet users: <b>31 million</b>	
Total fixed broadband customers: <b>5.6 million</b>	
What are the issues?	
<b>Network</b>	
Community consultation, environmental issues and legal compliance associated with network rollout	
Mobile phones, masts and health	
Energy use and climate change	
E-waste	
Health and safety	
<b>Products and services</b>	
Access to communications for those currently excluded	
Socio-economic impact of mobile	
Content standards, protecting young and vulnerable users	
Privacy, security and location-based services	
<b>Brand presence and retail</b>	
Responsible marketing and advertising	
Handset reuse and recycling	
Clear and transparent pricing	
Customer education on sustainability issues	
Supply chain	

## Our sustainability communications

We report on our performance and management of sustainability issues across a range of formats designed to be accessible for various audiences.

### Sustainability report

Reports our performance in 2009/10 and progress against our objectives.



### Sustainability website

Outlines our approach to each issue and provides more information on our sustainability management.

Visit [www.vodafone.com/responsibility](http://www.vodafone.com/responsibility).



### Local market reports



Nine of our local markets produced their own Sustainability Reports during 2009/10, focusing on local and national issues with details of individual local market sustainability programmes.

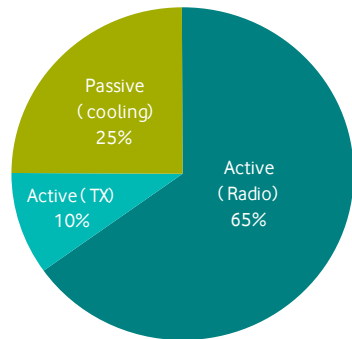
Source Vodafone Sustainability report March 2010

Read more at [www.vodafone.com/responsibility](http://www.vodafone.com/responsibility)



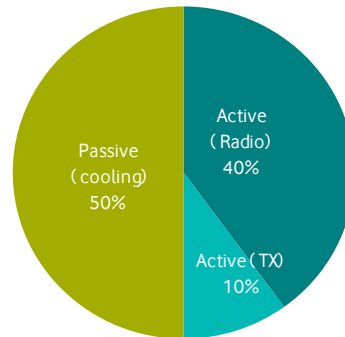
# The Network energy challenge

## Europe

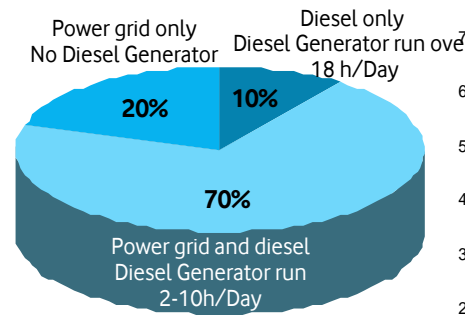


Typical Energy Distribution at the Europe Site

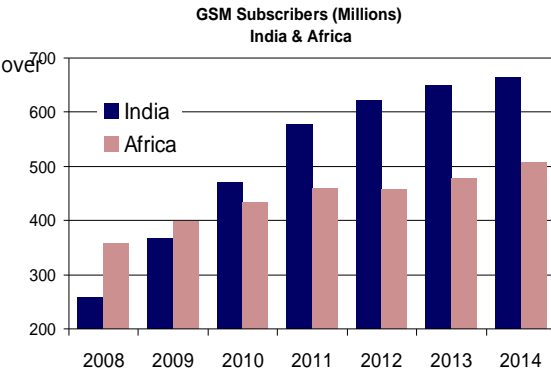
## Emerging Market



Typical Energy Distribution at the emerging market Site



Energy source breakdown in India



Source :Juniper Research



The majority of the sites in India and Africa use Diesel Generators  
(10% off grid and solely reliant on diesel generators; further 70% need diesel generators as backup due to an unreliable grid supply )

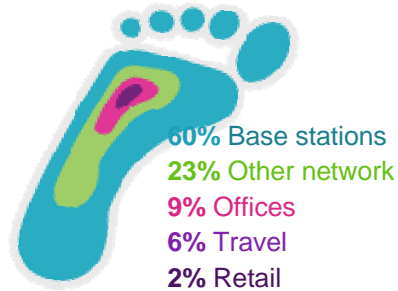
According to analysts 80% or more of all new mobile phone subscribers per annum will come from emerging markets and majority of stake will correspond to rural inhabitants.

**Together with the industry our mission is to accelerate Time-to-Market for Innovative green technology solutions**



# Green energy solutions are not only about solar!

## Vodafone CO2 Target

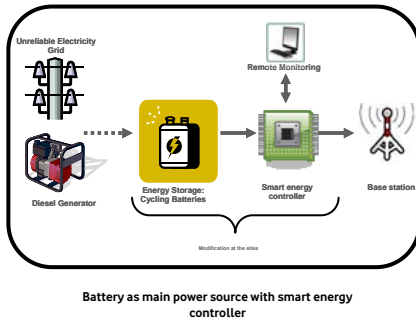


## Energy efficient products



- > Developing **100% green powered innovative radio base station** solutions
- > You cannot manage what you do not measure: Vodafone is main promoter of **implementing standards energy monitoring** features.
- > Vodafone is implementing on **large scale standardised efficient products** ('free cooling' and adjusting temperature set points within our radio network, combined with TRX low-traffic switch-off, RRH implementation etc...
- > Better **control of Diesel Operation** by implementing alternatives using Batteries as main power sources.
- > Drive Technology innovation for **renewable energy solutions** using **(Solar+Wind)** for mass usage in emerging markets.

## Smart energy controller



## Renewable energy sources



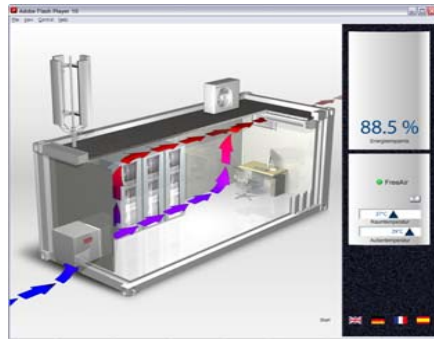
**Its our responsibility to drive Innovation in Network Efficiency and Green Technologies**

**...Design to real need**



# Energy Efficient Products

## Free Cooling

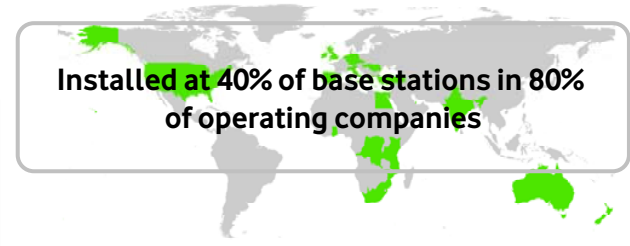


Free-cooling, using outside fresh air to cool equipment, saves energy compared to air-conditioning

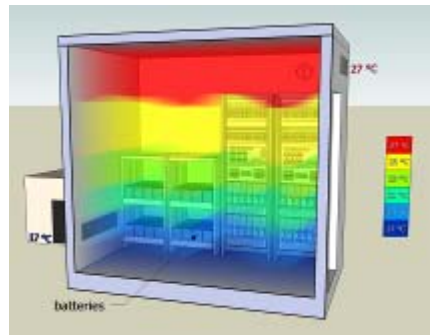
The energy consumption can be reduced with free cooling for an average site by 3,500 kWh per year.



Installed at 40% of base stations in 80% of operating companies



## Operating Temperature

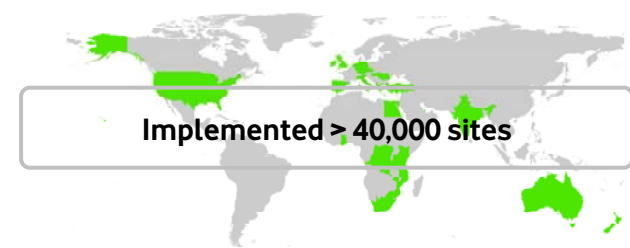


Increasing maximum operational temperatures of equipment reduces energy used for air-conditioning

The cooling energy consumption can be reduced for an average site by 2,750 kWh per year.



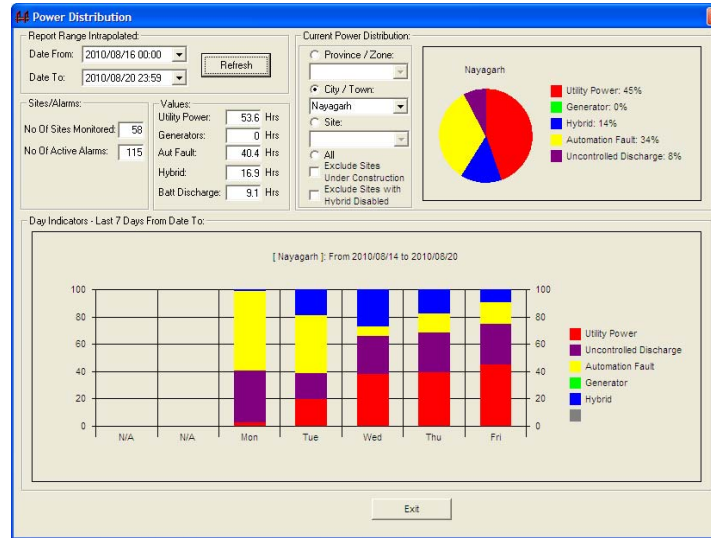
Implemented > 40,000 sites



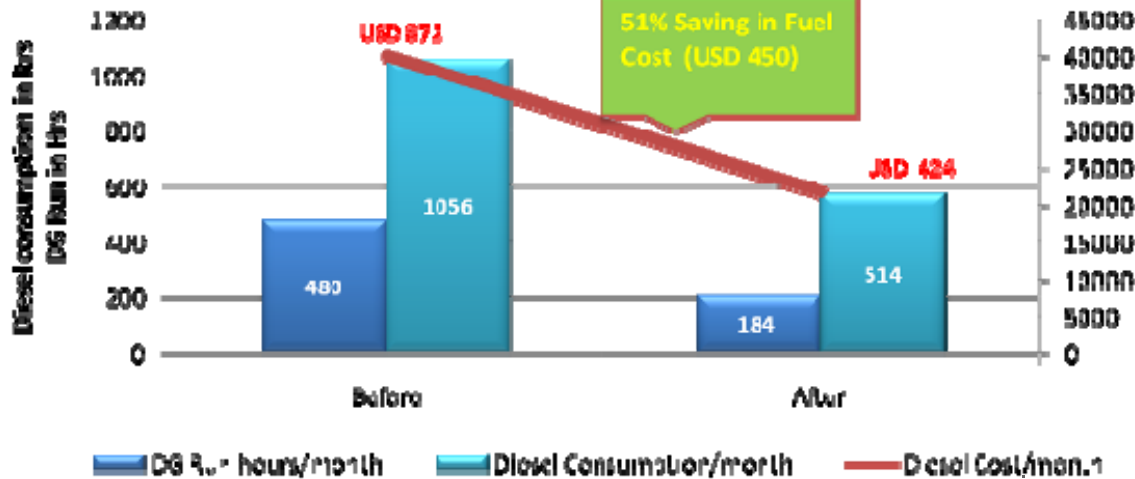
# Diesel Battery Hybrid



- ❑ Fuel Saving - 51% which will translate to saving of 7200 ltrs of diesel per site per year.
- ❑ A DG runtime saving of 61% resulting in the Generator life span increase of 4.8 years.



## Hybrid Site Pilot finding



- ❑ Real time Grid, DG and battery back up hours are captured through RMS on daily basis. Controller also intelligently records manual DG run hours and uncontrolled battery discharge time.
- ❑ Monthly cumulative reduction in DG run hours, fuel consumption and opex saving will be recorded
- ❑ Diesel filling will be stopped on sites with zero DG run hours and DG set might removed permanently.

Source : Vodafone Essar Ltd



# Solar/Wind

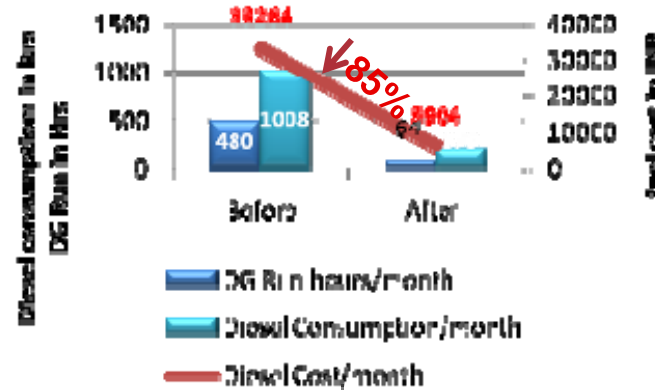
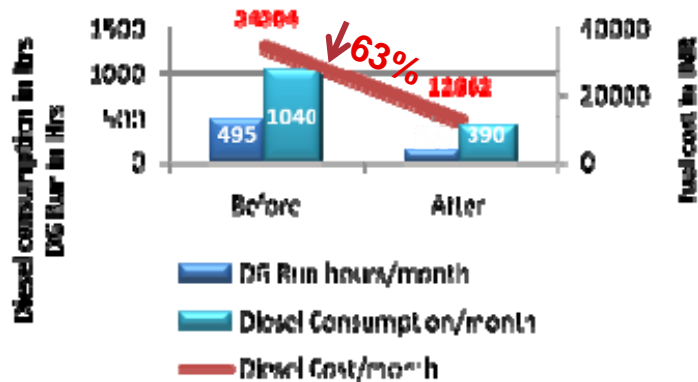
## Indoor off-Grid Site with DC Aircon



## Outdoor off-Grid Site, no Aircon



Solution saves between 80% and 100% on diesel consumption with payback period <3 years



Benefit from	
Solar	25%
DG/Battery/Controller	48%
<b>Total</b>	<b>63%</b>

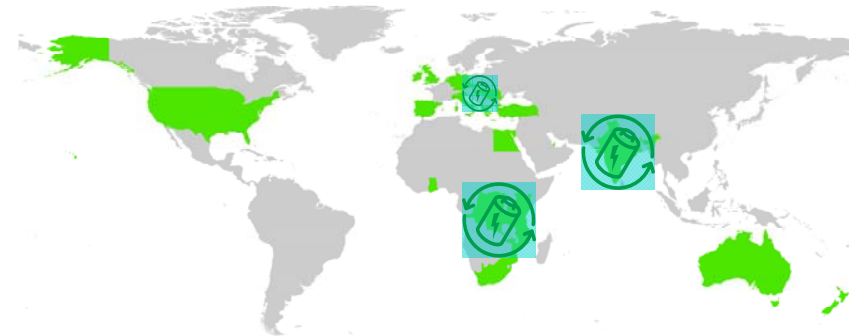
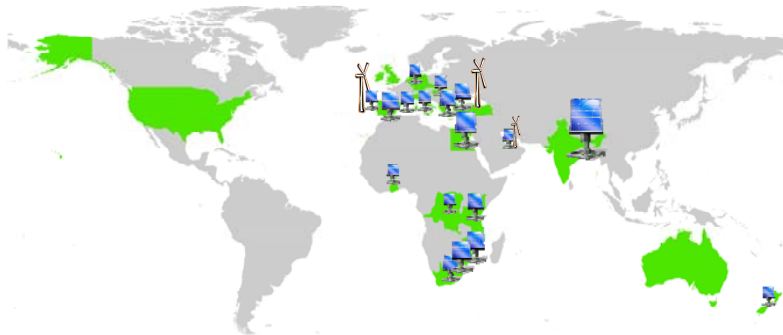
Benefit from	
Solar	22%
Wind	negligible
DG/Battery/Controller	63%
<b>Total</b>	<b>85%</b>

Source: Vodafone Essar Ltd



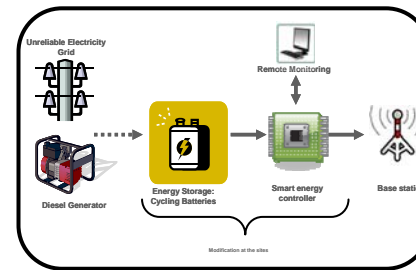
# Green Deployment: by end of 2010

Solar & Wind, Diesel & Battery Hybrid



Solar & Wind

> 850 sites



Battery as main power source with smart energy controller

Diesel & Battery Hybrid

> 3000 sites





# Summary

- > optimized solution is key for Design of green site :
  - Green solution should be dimensioned based on actual site survey and pre measurement and equipment load.
- > Design for real need
  - Experienced Partners Essential
  - Radio Technology drives the design – in Green Energy this may even be feasible to exchange for newer technology.
- > Technology, Service & Integration must be considered as a composite package
- > Drive investment and maintenance costs down
  - Cost optimised design and production of Green Technologies
  - Innovative procurement models

***“ Green Power is good for the environment and also makes sense for the business..”***



**Thank you**

