

Green Power for Mobile Africa Working Group, Kampala (28-29 May 2013)

New trend for telecom batteries usage

Back-up solution to Power Generation

First key driver will be Mobile Data traffic explosion

Appetite for data will drive Mobile Telecom Base Station growth across all regions

New devices compared to basic mobile data traffic

Smartphone		=	x 24*
Handheld Gaming Console		=	x 60*
Tablet		=	x 122*
Mobile Phone Projector		=	x 300*
Laptop		=	x 515*

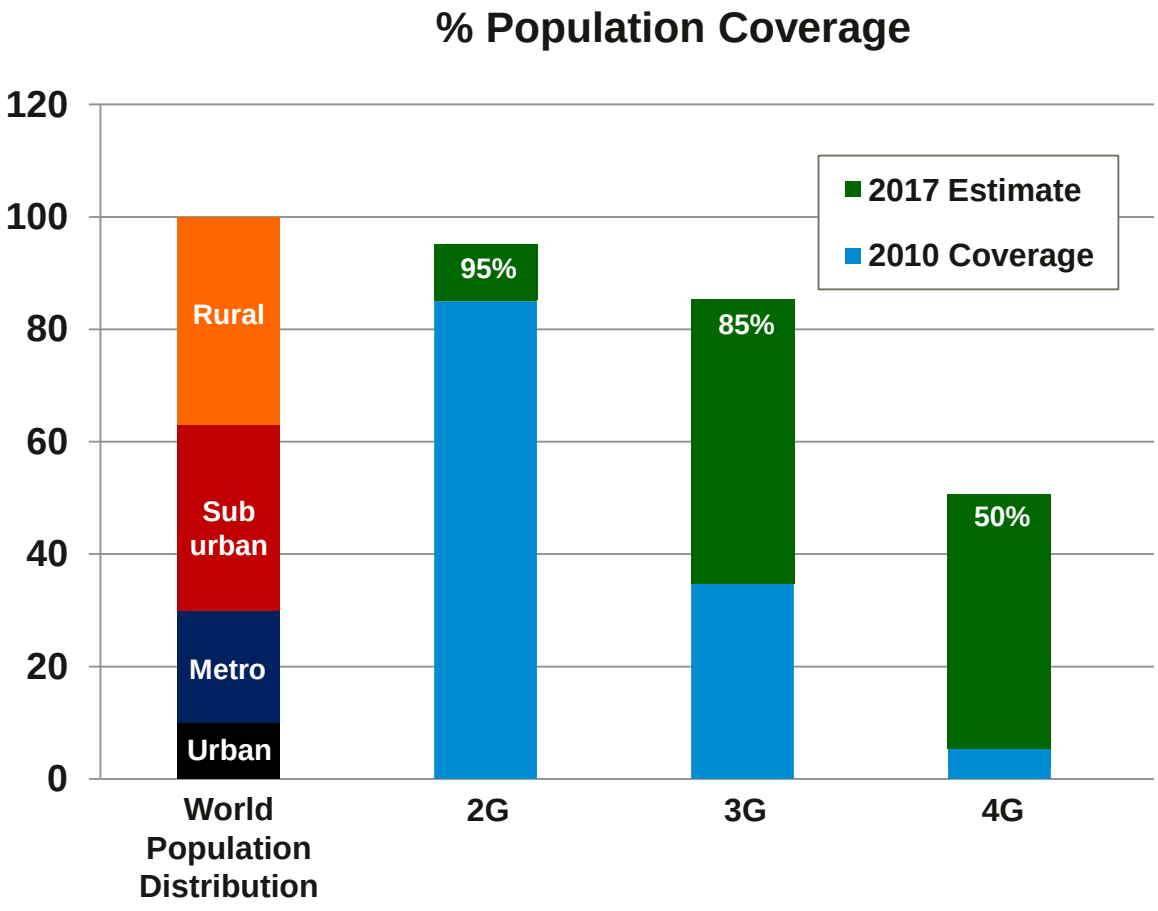
* Monthly basic mobile phone data traffic

Source: Cisco

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Coverage expansion will be another key driver

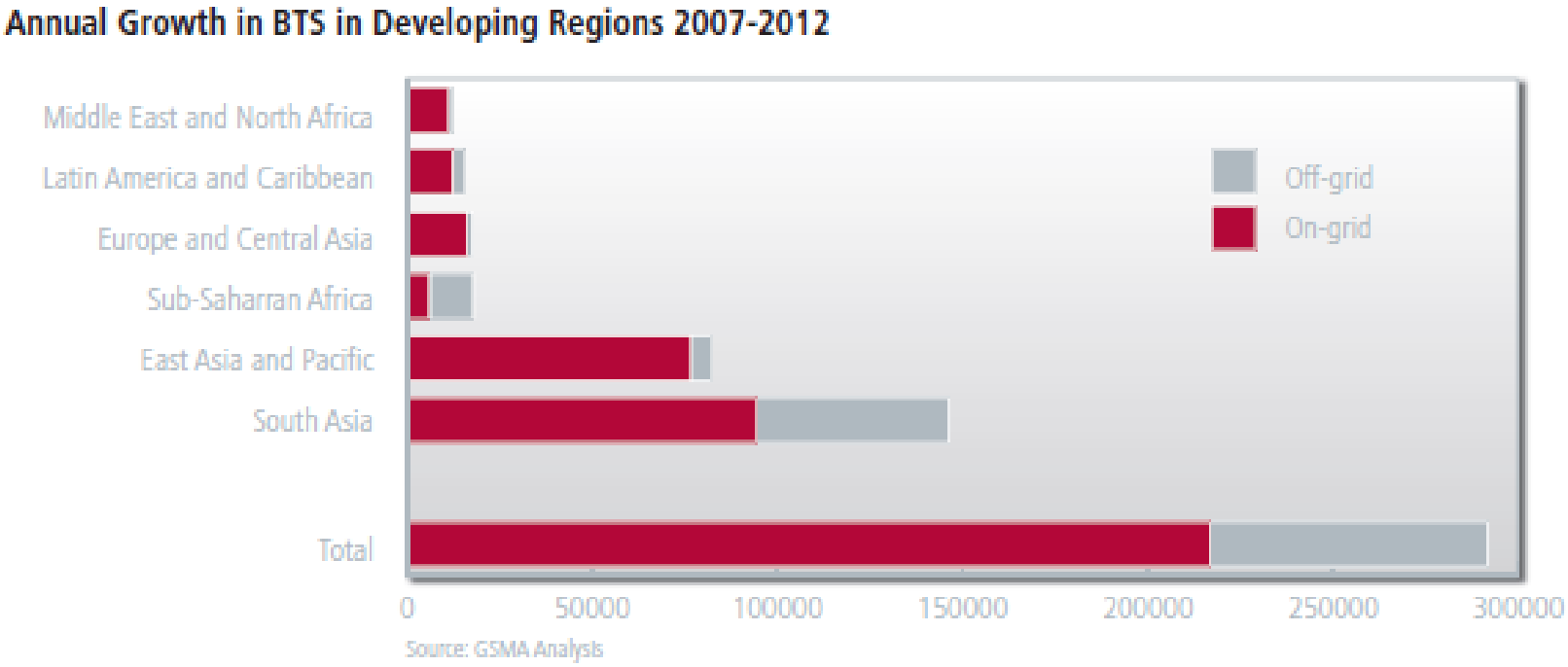
3G will expand, especially in rural areas, where the power grid is either unreliable or non-existent. This means more demand for premium AGM lead acid batteries to generate power during long power outages or when running with Hybrid or Off Grid Solutions.





Off Grid Telecom

An estimated 75,000 new off grid sites will be built each year in developing countries through 2013...



...reaching a 600K Installed base

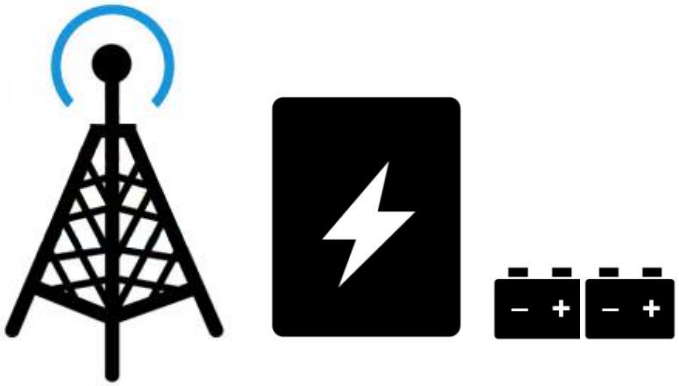
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The evolution of telecom power systems

A shift to developing markets is driving the need for alternative power solutions, where batteries are becoming the key element of **power generation**

Before

Developed Markets:
Stable grid, normal temperatures



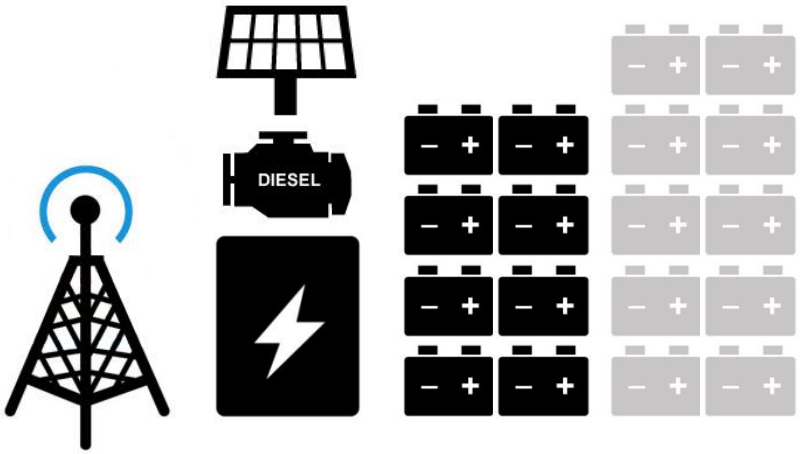
Large base station

Large DC system

2 hours battery backup
8 years life

Now

Developing Markets:
Unstable or no grid, high temperatures



Smaller base station

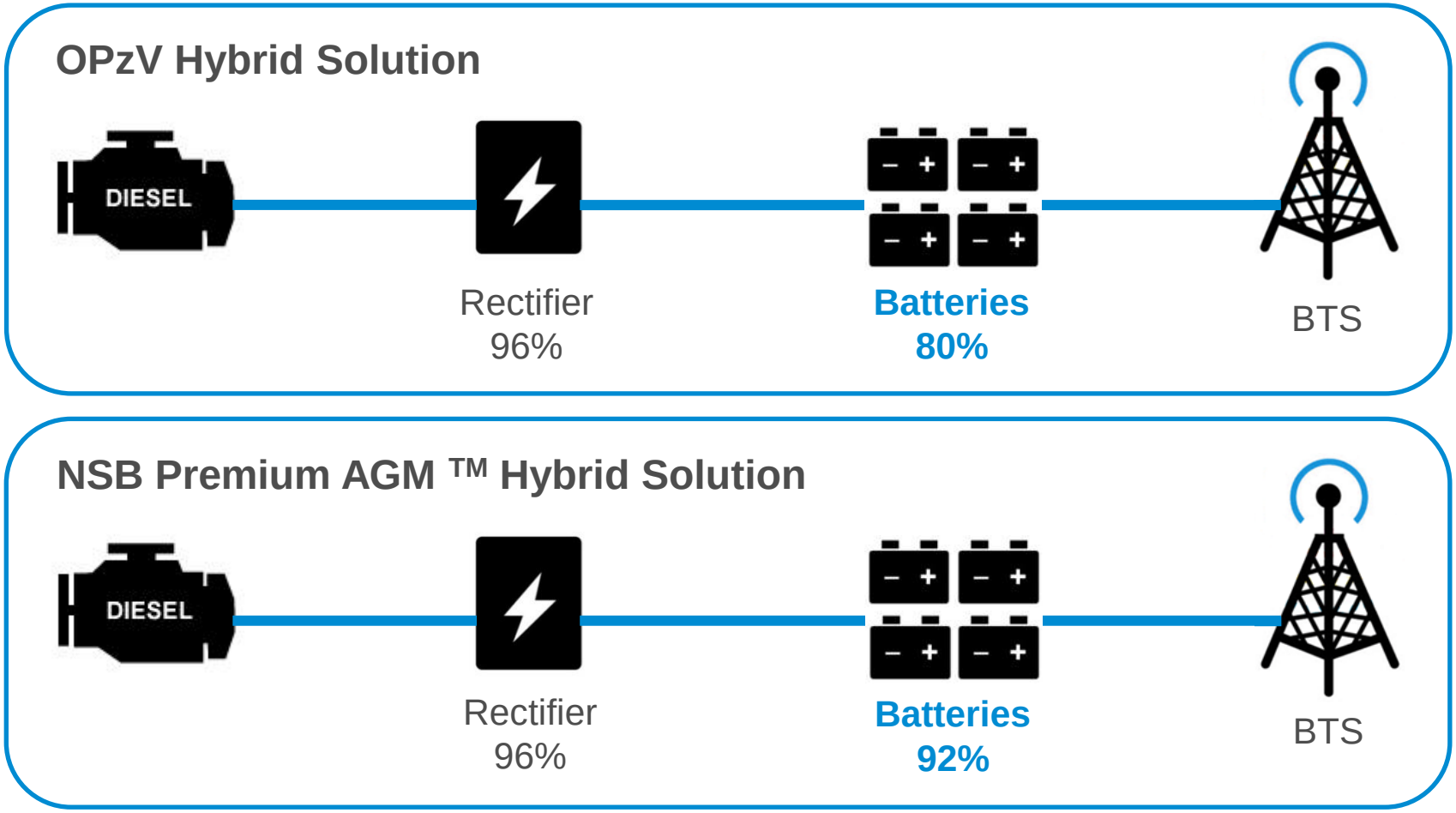
Power system, generator or renewable energy

8-10 hours battery backup
2 years life

Frequent battery replacement

Battery usage and volume has been evolving over years driving need for higher performance battery

Efficiency Calculation



Total efficiency for OPzV solutions is 55% vs 70% for Premium AGM Battery solution

Advanced Technology for Premium AGM Lead-Acid Batteries

- High efficient battery technology
  Low Internal resistance, less heat generation, less cooling energy needed

- Thin Plate Pure Lead Technology
  Fast recharge, High discharge rates and High charge acceptance

- Low self discharge rate: Long Shelf life 24 month at 25°C

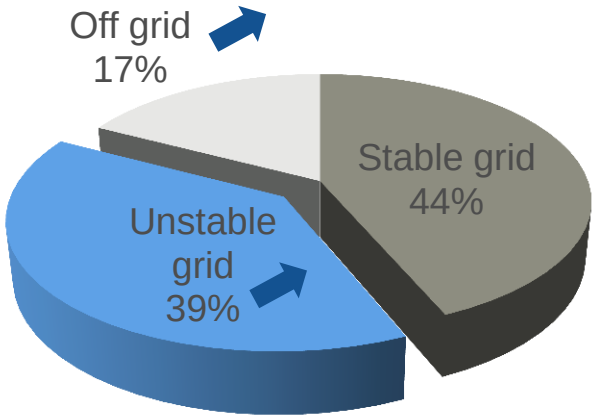
- Dual venting ports : Efficient and safe gas evacuation technology for OD cabinets

+ High temperature resistant plastic container in PPO Stable up to +65°C
+ Partial State of Charge (PSOC) cycling technology delivers over 2000 cycles in typical unstable grid conditions
+ High fuel savings when used with hybrid Genset applications

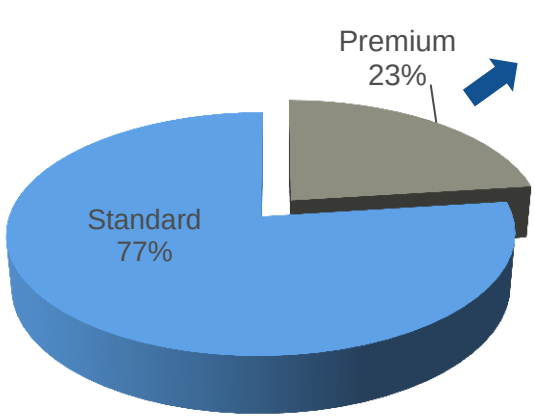
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Telecom Battery Market is a 2.3 BUSD Market with Premium Batteries gaining share

Market per Grid Profile



Market for 12V Battery type





Thin Plate Technology / Pure Lead
Fast recharge – High cyclic

Standard cost-effective technology
Standby Application



Higher growth



Premium Products

Advanced Technology Pioneers & Ahead of the competition

Blue Star Technology®

The proven performance of *Blue Star Technology®*
now enhanced to deliver more power, high cycling and fast recharge.

+ Modified electrochemistry delivers fast recharge, PSOC cycling and high efficiency
+ Ideal for demanding environments with unstable mains power or off grid
+ Fast recharge performance
+ High efficiency up to 99.5% Ah
+ Partial State of Charge (PSOC) cycling technology delivers over 2000 cycles in typical unstable grid conditions
+ High fuel savings when used with hybrid genset applications
+ 2 years shelf life at 25°C
+ Only NorthStar batteries have an operating temperature range of -40°C to +65°C
+ NSB Blue + Batteries are available in 92 Ah, 100 Ah, 170 Ah Front Terminal and 2V 400 Ah Top Terminal configurations



NorthStar Outdoor Cabinets : SiteStar™ Technology

The most advanced telecom cabinets in the world have one thing in common: they all use **SiteStar™ Technology**, a combination of advanced components, design innovations, and state-of-the-art manufacturing processes.

Exceptional Cooling

Active compressors ensure optimal battery operating temperature, which multiplies battery life, reducing replacement costs

Robotic Construction

90% of each cabinet is constructed using automated robotics to ensure reliability and lower maintenance costs



High Efficiency

Cut electricity costs by up to 95% compared to other cabinet solutions

Innovative Insulation

Ensures optimal battery operating conditions inside the cabinets, no matter what the temperature is outside

NorthStar

SiteStar™ Energy Consumption

The lowest energy-consuming battery cabinet in the industry – uses up to 95% less energy than traditional solutions

Power Consumption Battery system on float charge		
Ambient temp.	20C/20C inside 'ECO' *OFF*	25C/15C inside 'ECO' *ON*
+50 C	158 W	132 W
+45 C	96 W	74 W
+35 C	50 W	39 W
+25 C	16 W	16 W
+20 C	16 W	16 W
+10 C	28 W	16 W
0 C	63 W	47 W
-10 C	99 W	79 W
-20 C	133 W	110 W
-30 C	169 W	142 W
-40 C	206 W	174 W





Questions and Discussion