

绿色·我们在行动 Green·we are in action



Green Technology Touches Green Future

**China Mobile
November 2011**



Outline

- **Green Action Plan in China Mobile**
- *Green technologies and concern*
- *Suggestions for Green Touch*



GAP in China Mobile

GAP=Green Action Plan

TARGET

Reduce power consumption per traffic unit by 20% by 2012 compared to 2008 levels.

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Prevent the CO2 emission
10.03 million tones



Saving 1.45 million tones of
standard coal energy



Saving 11.8 billion degrees of
electricity power



Strategic Partnership

Major Equipment Vendor

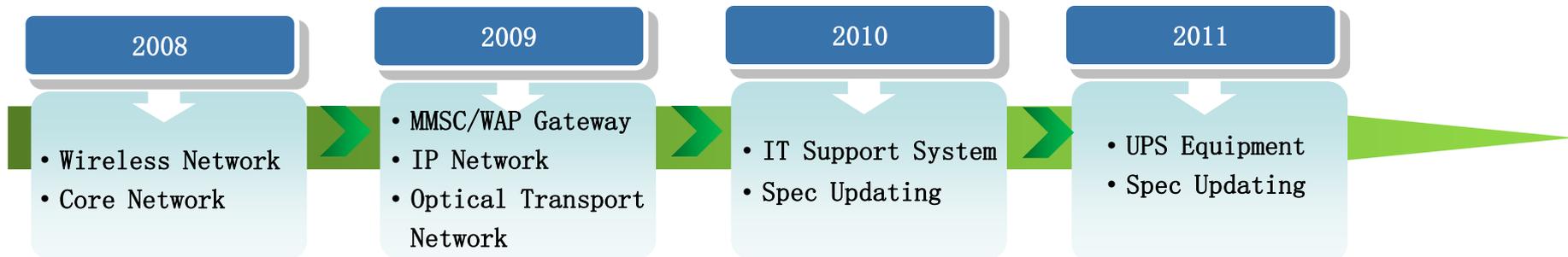
IT Equipment Vendor

Auxiliary Equipment Vendor



CMCC Class Specification on Energy Consumption

- **Release CMCC Class Specification on Energy Consumption from 2008.**
- **Cover equipments of 7 areas**
 - **Wireless Network-GSM BSC/BTS TD-SCDMA RNC/BBU/RRU**
 - **Core Network-MSC/GMSC/HLR/SGSN/GGSN/IMS**
 - **IP Network-Switch/Router**
 - **Service Platform-MMSC/WAP Gateway**
 - **IT Support System-UNIX/X86 Server/Disk Array /Tape/Fiber Switch**
 - **Optical Transport Network-MSTP/WDM/PTN**
 - **UPS Equipment**
- **Focus on key parameters**
 - *Power Consumption*
 - *Weight/Volume*
 - *Energy Efficiency*





CMCC Class Specification on Energy Consumption

- *Definition of the specification*
 - *Base on lab test*
 - *Vendors' roadmap*
 - *Updated per 2 years*
- *Application of the specification*
 - *Key evaluation points in purchasing equipment*
 - *Label equipment based on evaluation with 3-Grade A/B/C*
 - *Lead vendors' roadmap*



Phase CMTD1: 2011~2012年

Phase CM3: 2012~2013年

Phase CM2: 2010~2011年

Phase CM1: 2008~2009年

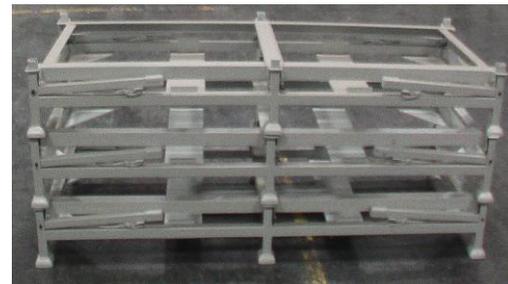
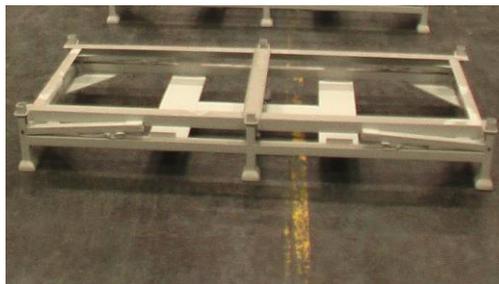


Traditional Package VS Green Package

Traditional Packages



Green Packages





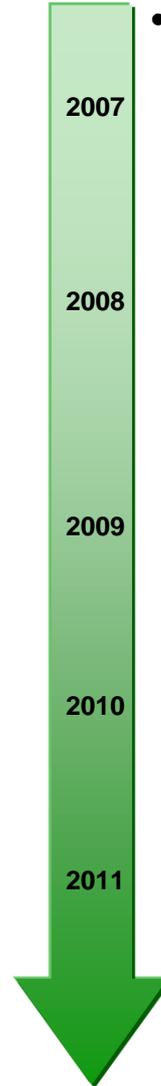
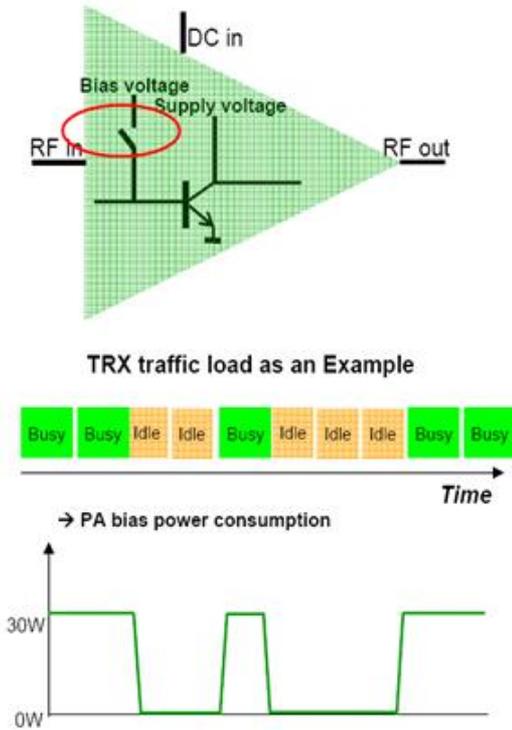
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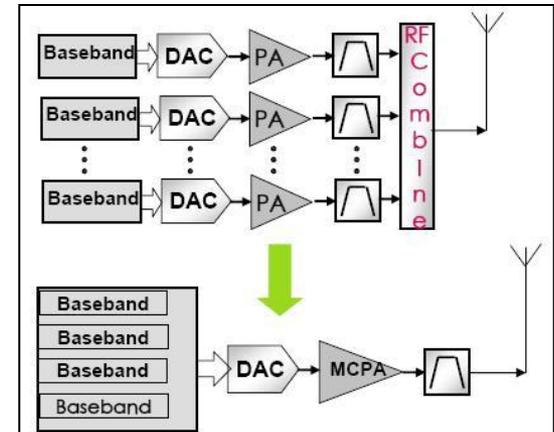


Power Saving Technologies introduced on BTS

- Applying power saving technology in GSM and TD-SCDMA network
 - PA bias on/off based on time slot
 - 12%~20% power saved



- Introducing new BTS with lower power
 - MCPA(Multi-Carrier Power Amplifier) BTS massively deployed in GSM network since 2009
 - Distributed base station(BBU+RRU) widely deployed in TD-SCDMA
 - High power efficiency PA technology used in RRU, i.e. DPD, Doherty
 - power efficiency improved





Energy Efficiency Improvements on Auxiliary Equipments

Air conditioner Efficiency

Developed specified energy-saving air conditioning system for base stations with more efficiency

Introducing Natural Cooling System

Thousands of natural cooling systems been installed to reduce cooling energy consumption.

Renewable Energy Deployment

Thousands of renewable energy BTS sites have been deployed.

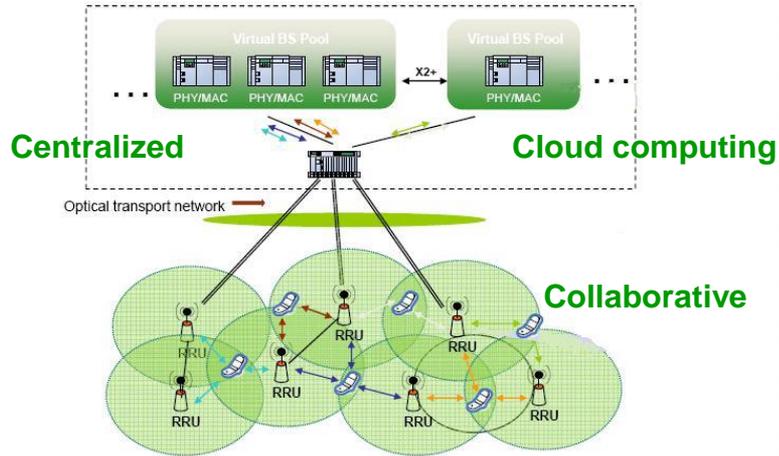
Power Supplier & New Battery

Cooling the batteries separately to raise the site temperature.

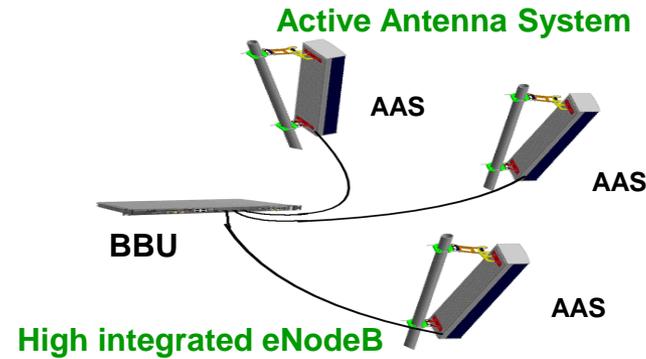


Green concern on Wireless Network

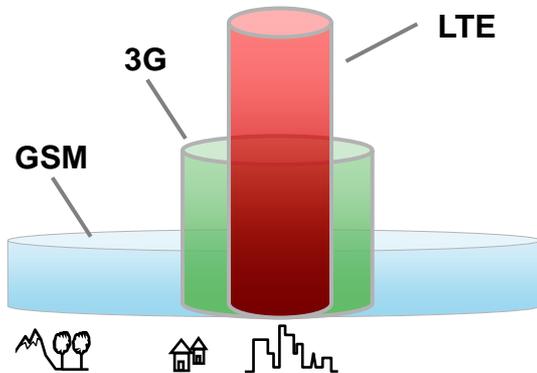
Green C-RAN Architecture



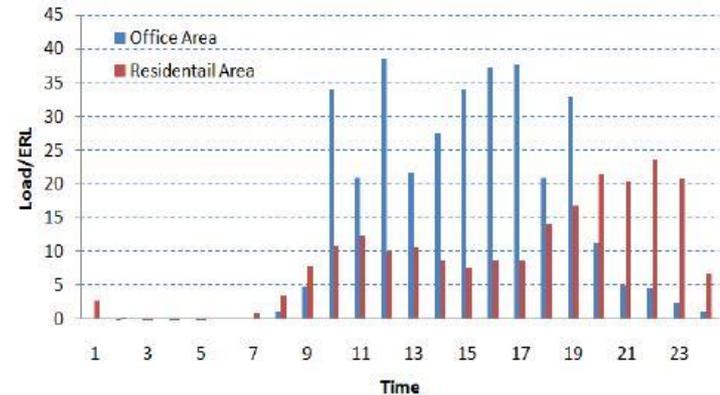
New type of Base Station



Multi-RAT Traffic Steering Mechanisms

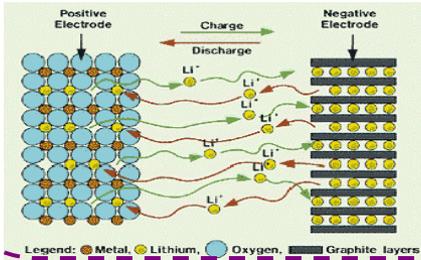
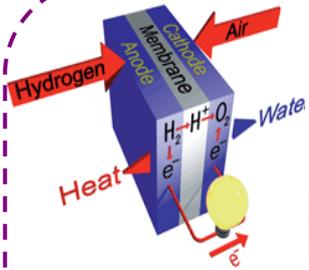


Improve Utilization Rate with Dynamic Load





Green concern on Site and Infrastructure



Research on the new generation batteries like fuel cell and Li-ion battery Make the system less emission and more environment friendly



Drive the new generation renewable energy system which meet the requirements of high stability and low maintenance



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Suggestions

- What is our concern now
 - Development on inner structure of equipment to enhance power efficiency.
 - Research on new structure of telecommunication network to reduce total power consumption.
- More operators' voice are needed in Green Touch.
 - Now: Technology Driving
 - Future: Requirement Pulling
 - Some requirements from operators are necessary to be widely involved, well researched, and may lead the trends as well.
- Looking forward to cooperating with every member in Green Touch.



Thank you !

***By helping someone today, you may also be helping yourself.
Let's have a green future!***