Mama - 妈妈

Wo Ai Ni - 我爱你

Hao - 好

Mei Wen Ti -没问题

Zai Jian - 再见

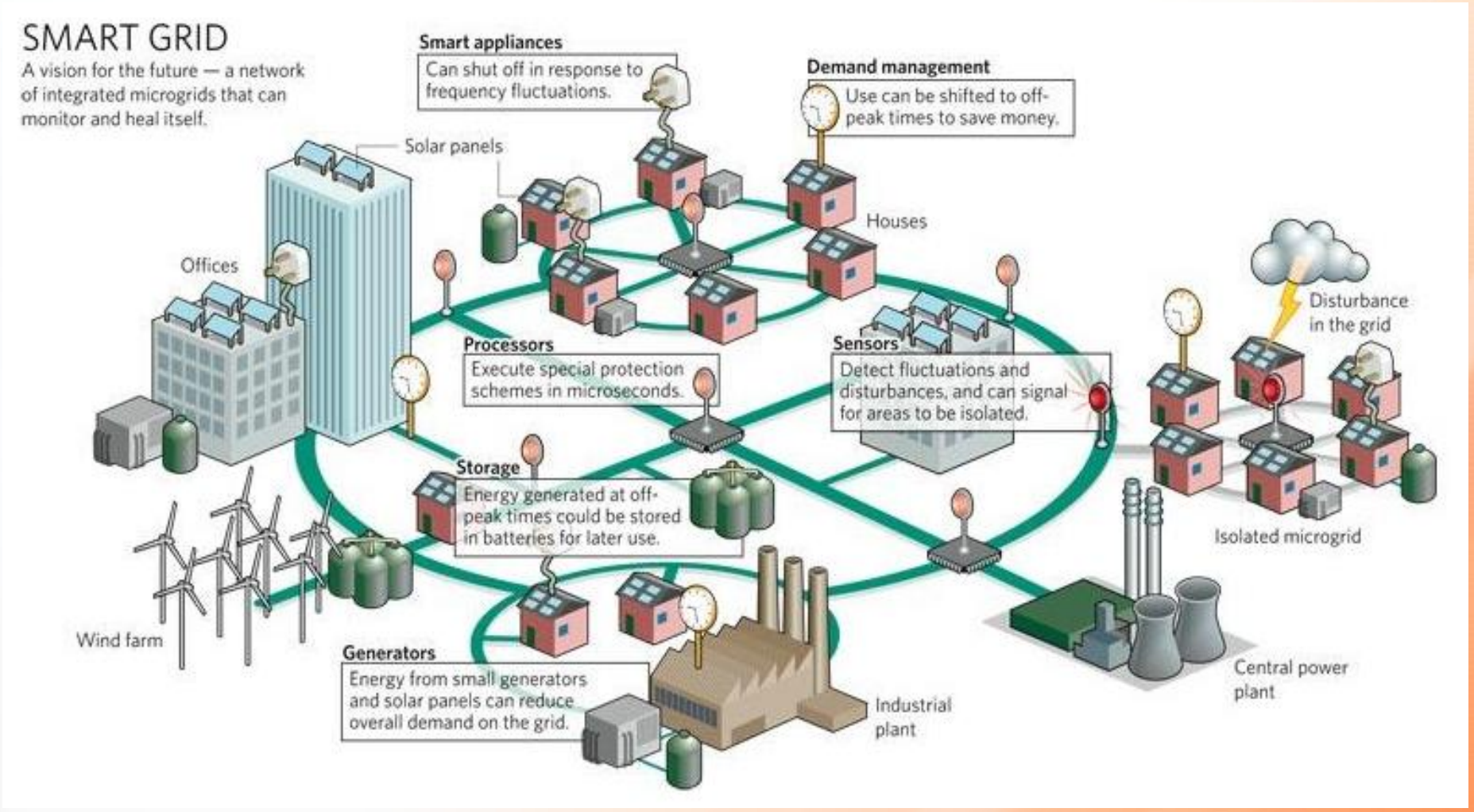

Winning The Future
NARADA BATTERY Strategy 2011

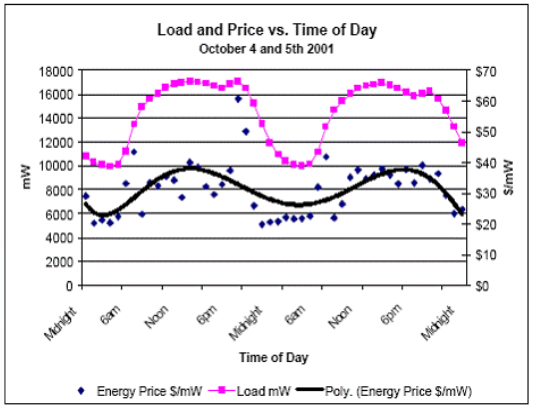

BATTERY- STORAGE ENERGY FOR SMART GRID
ENERGY SAVING & EFICIENCY SOLUTION

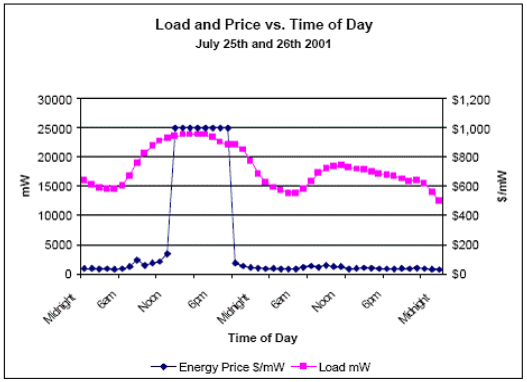
“Smart Grid” – efficient use of Energy…

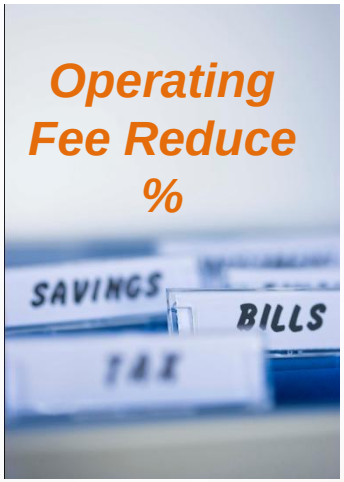


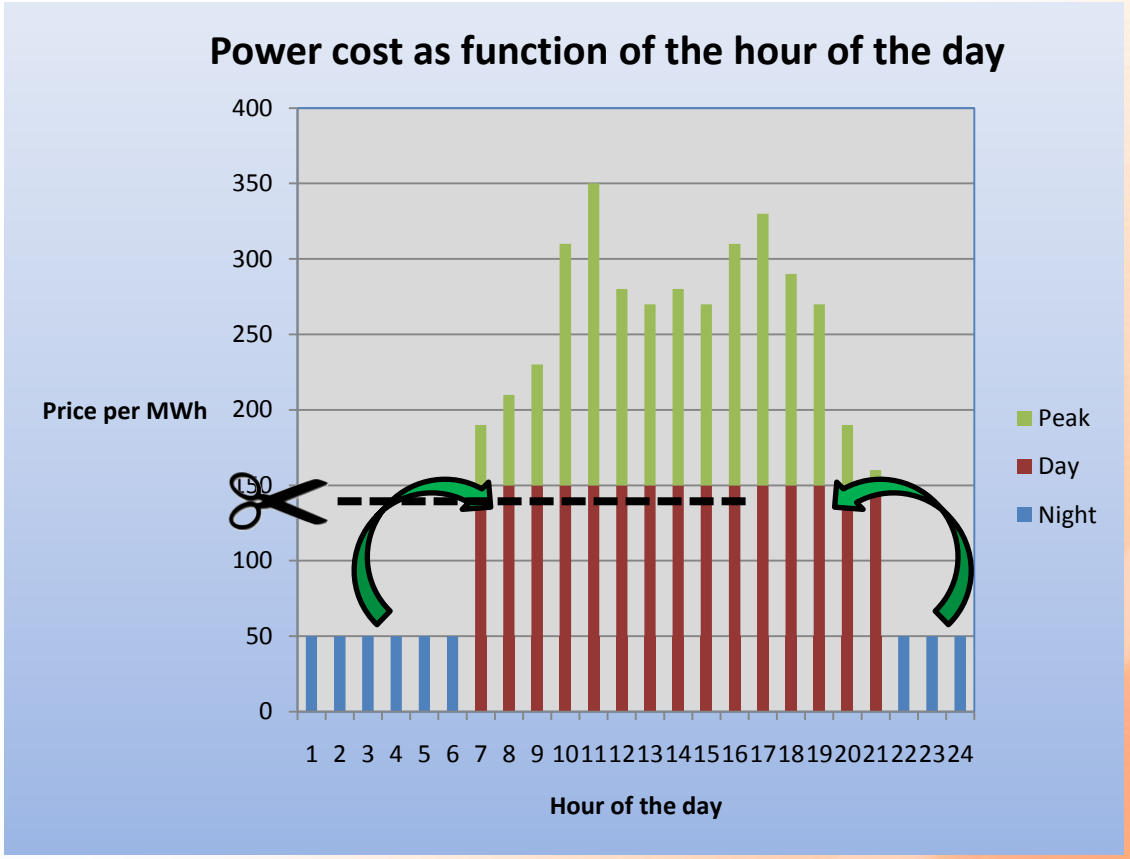
SMART GRID- IPOWER INTERGRATION SOLUTION OPTISMISE COMBINATION OF VARIOUS ALTERNATIVE ENERGY- GRID, DIESEL GEN, SOLAR, WIND , HYDRO, ETC WITH BATTERY STORAGE











Utilize the 0.5MWh Narada Battery to store low cost night power and avoid peak power load charges in the QingShan/LinAn EDZ Narada plant

Demonstrate the economic viability of the system


Partnering Together



The Narada 0.1MW – 0.5MWh demonstration plant



VRLA battery 2V cells

AC/DC/AC conversion

Cell monitoring

Battery rack

Air management

System maintenance



Line power management

Load management

Remote site supervision

Modular system housed in two containers and developed by Narada and State Grid

Solar & Wind Power

Major features of Narada Strategy for Storage Battery

1, “Green” Solution

2, Application Environment

3, Technical Improvement

4, Commercial Alliance Market Leader




Narada Focus : Making Quality Battery
Battery Challenges


Back to Basic
Back To School!
Upgrade
Knowledge & Productivity

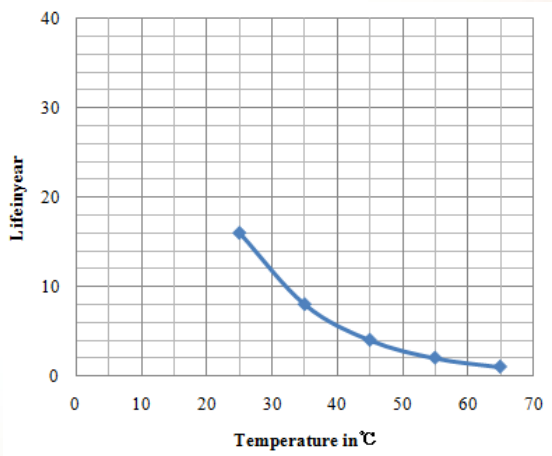

STRATEGIC PLANNIN
VISION STATEMENT
MISSION STATEMENT
STRATEGIC DRIVERS
WHAT
HOW
PURPOSE
CUSTOMER
TECH.

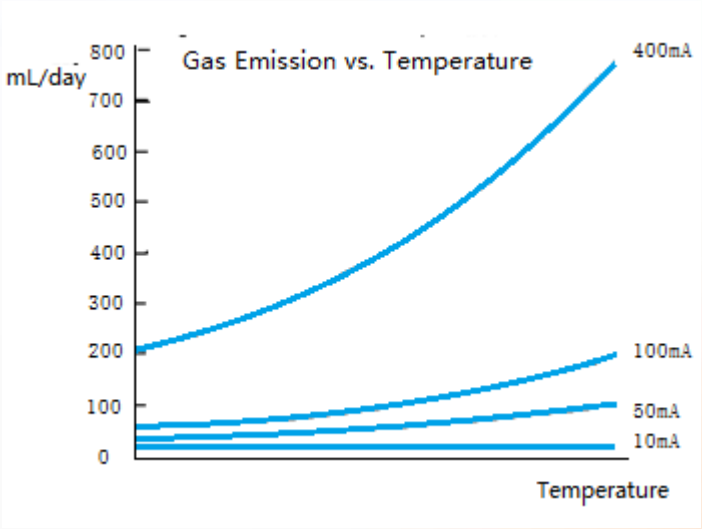
Battery Challenge_ Application Environment

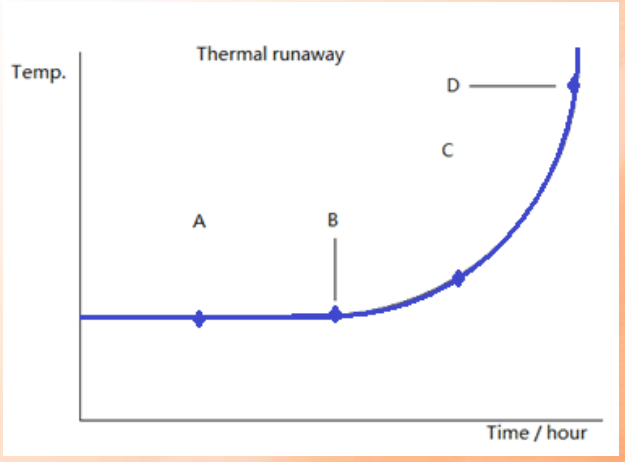
	Tech Challenges	Normal	Note
Optimum work temp.	20-40 deg C	20-30 deg C	
Air conditioner	No need or only set to 35 deg C	Need, and shall set to 25 deg C	Depending on location, air conditioner or free cooling box is acceptable
Fast charge performance	Better	Good	Fast charge generates heat fast
Expect life	15years at 35degC	15years at 25degC	Technology Design overcomes fundamental imbalances in the typical VRLA design at high temperature

Fundamental imbalances of normal battery at high temperature：

- Corrosion of positive grid
- Water loss
- Thermal runaway
- Sulphation of negative plate

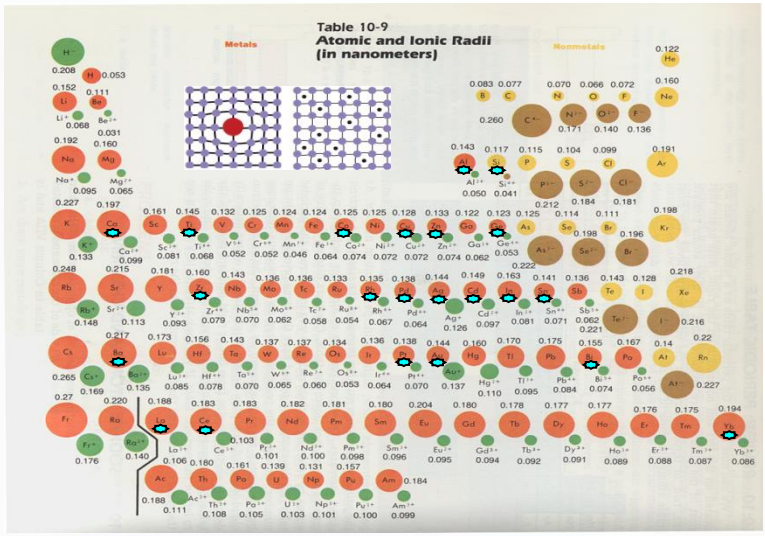






Technical Improvement

Improvement - alloy

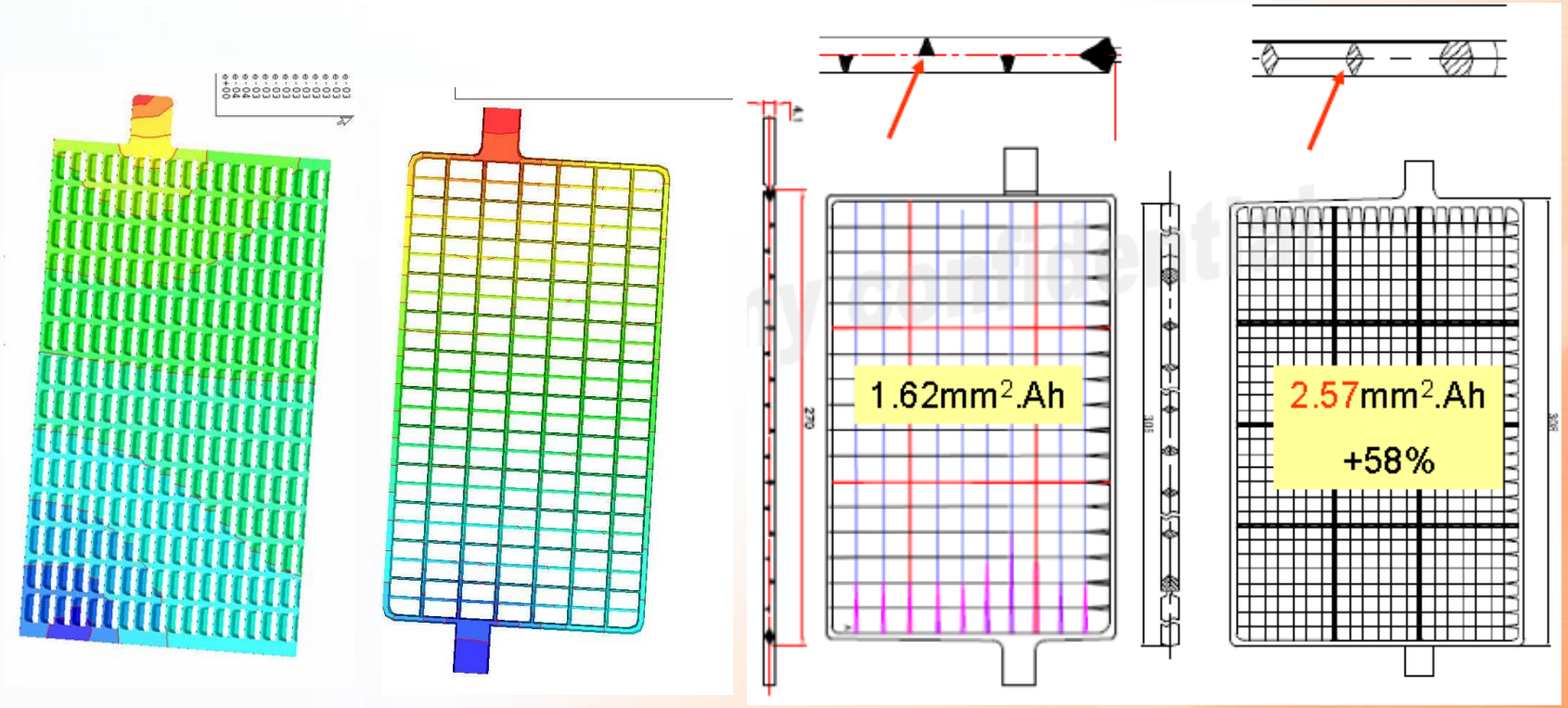




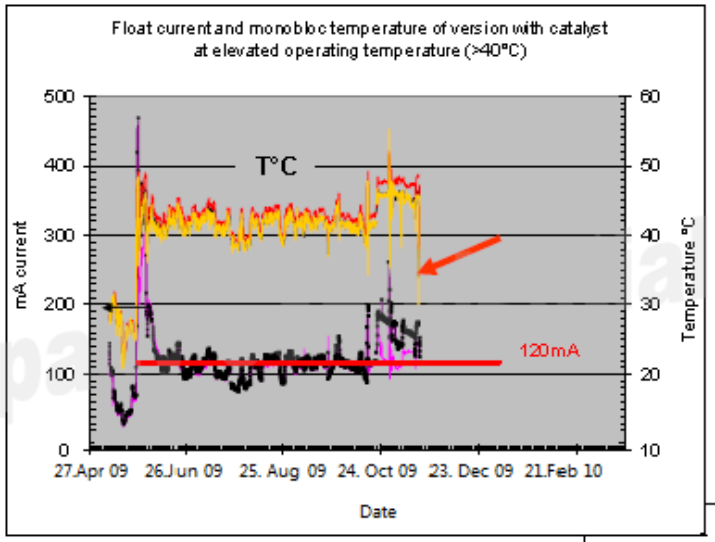
Corrosion construction of different alloy

Conclusion: some metal additional agent can increase grid anti-corrosion performance clearly

Improvement – special grid design



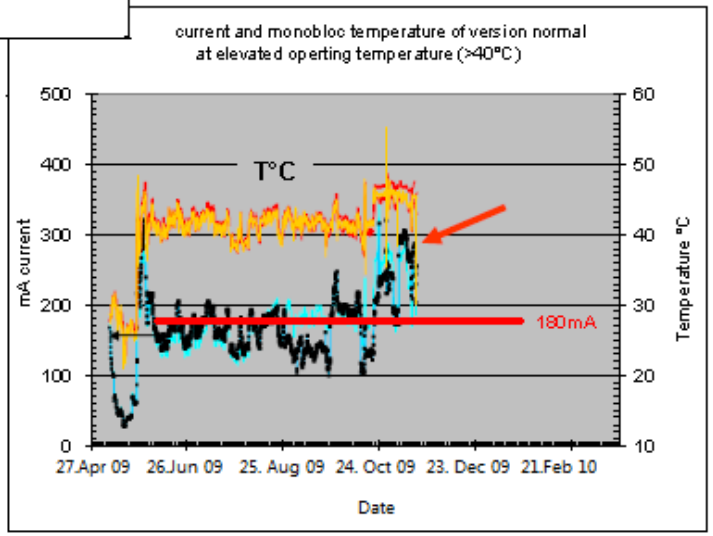
Improvement – oxygen recombination



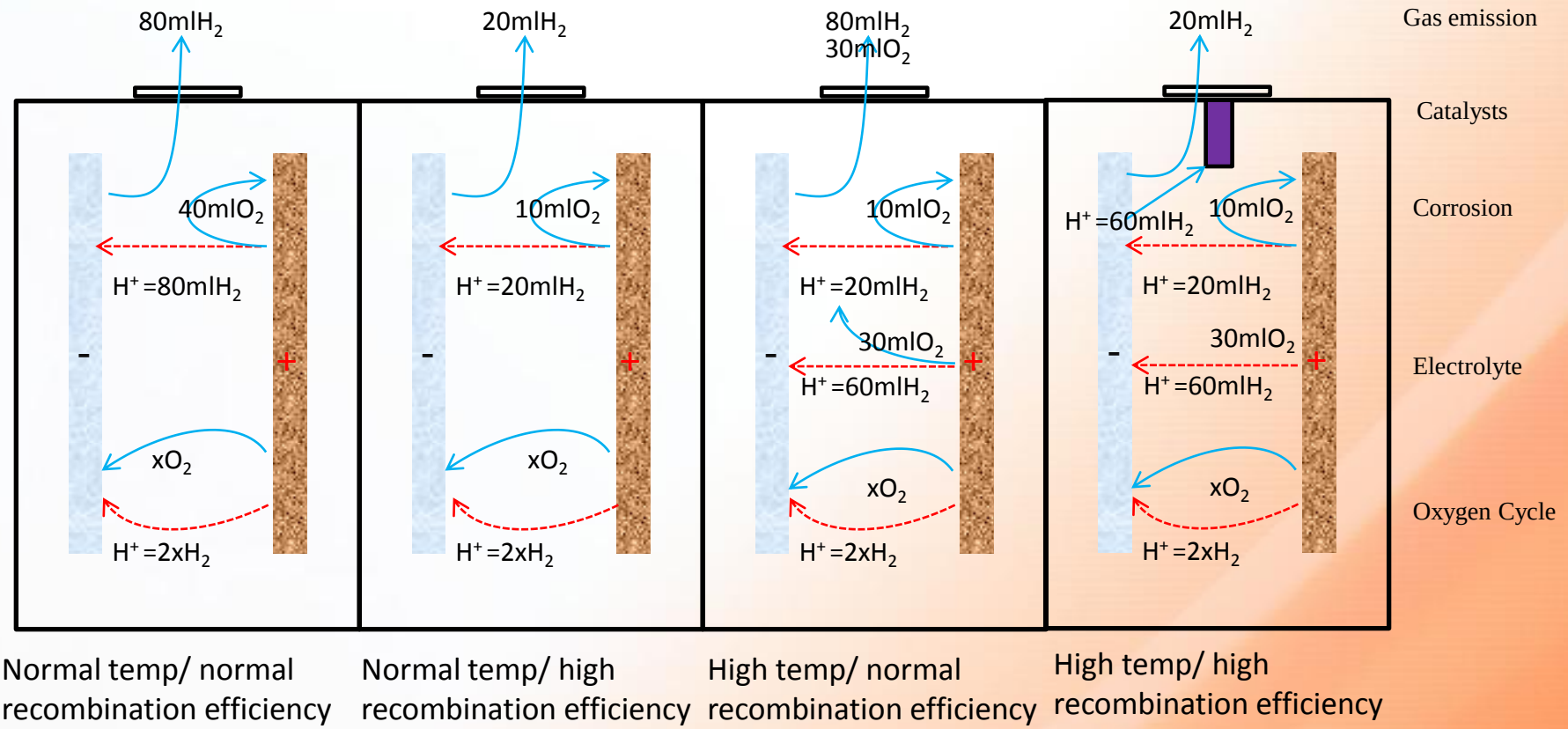


Slow down
of float current rise

For any second reaction of VRLA, float current can be treated as intuitional index



Technical Improvement



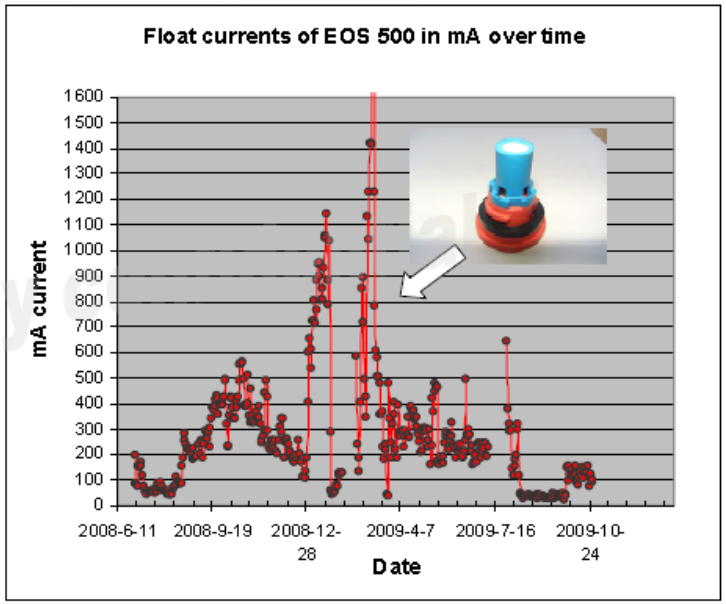
Normal temp/ normal recombination efficiency

Normal temp/ high recombination efficiency

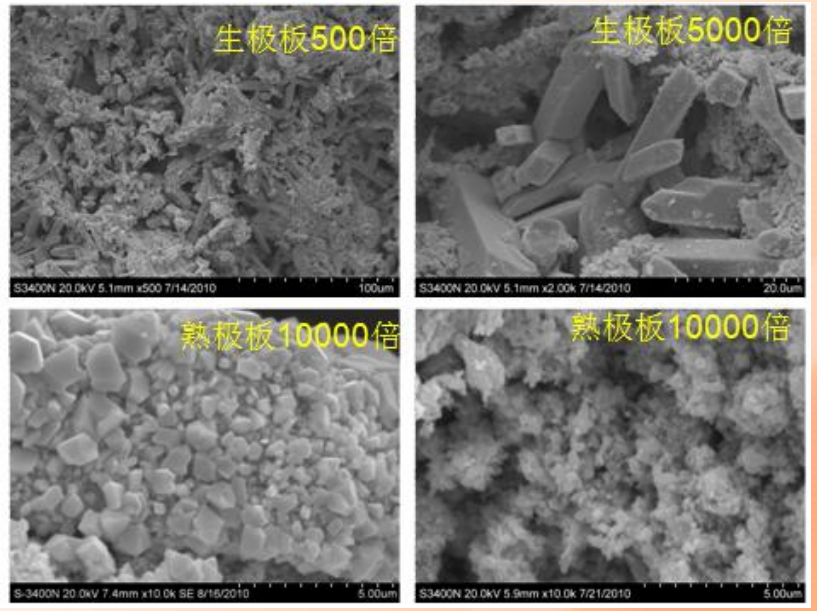
High temp/ normal recombination efficiency

High temp/ high recombination efficiency

Improvement – overcome sulphation



Reduce oxygen recombination on negative, increase polarization of negative

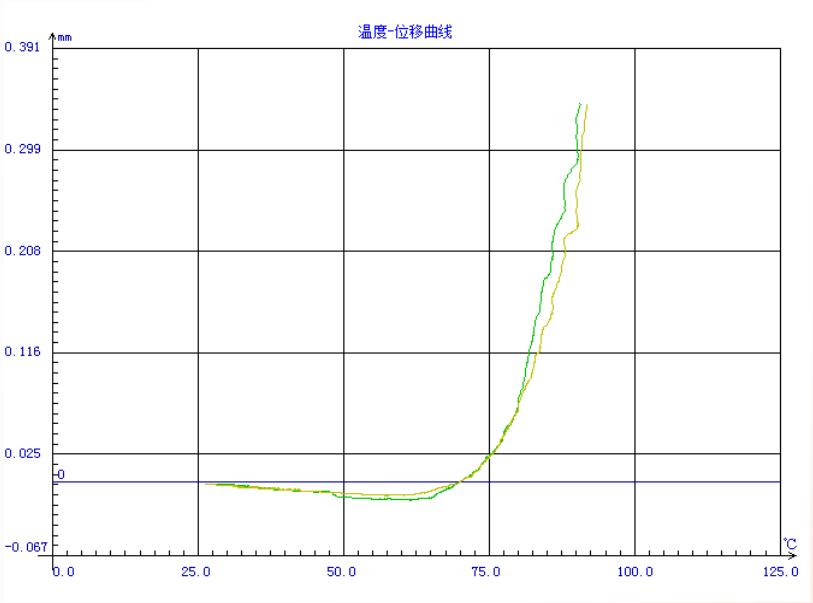


Change additional agent to increase negative performance

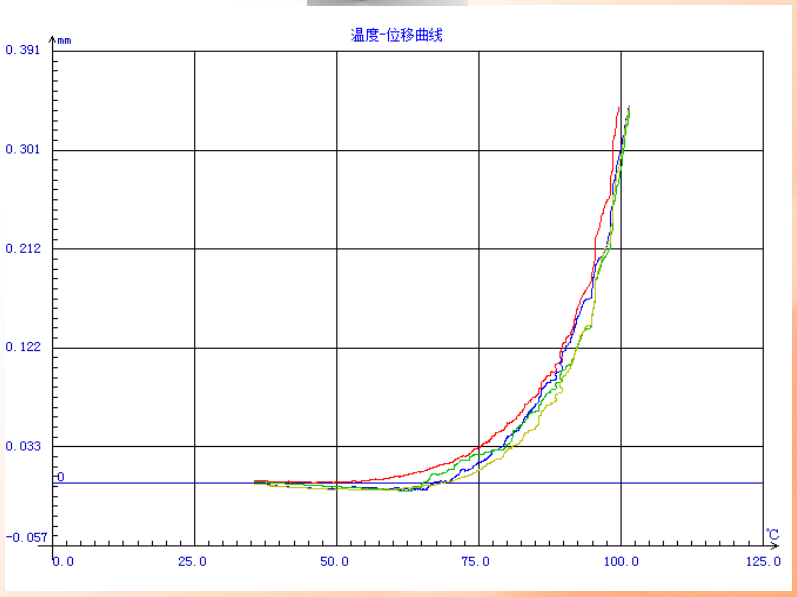
Technical Improvement

Improvement – high temp. case material





Distortion temperature curve of normal material

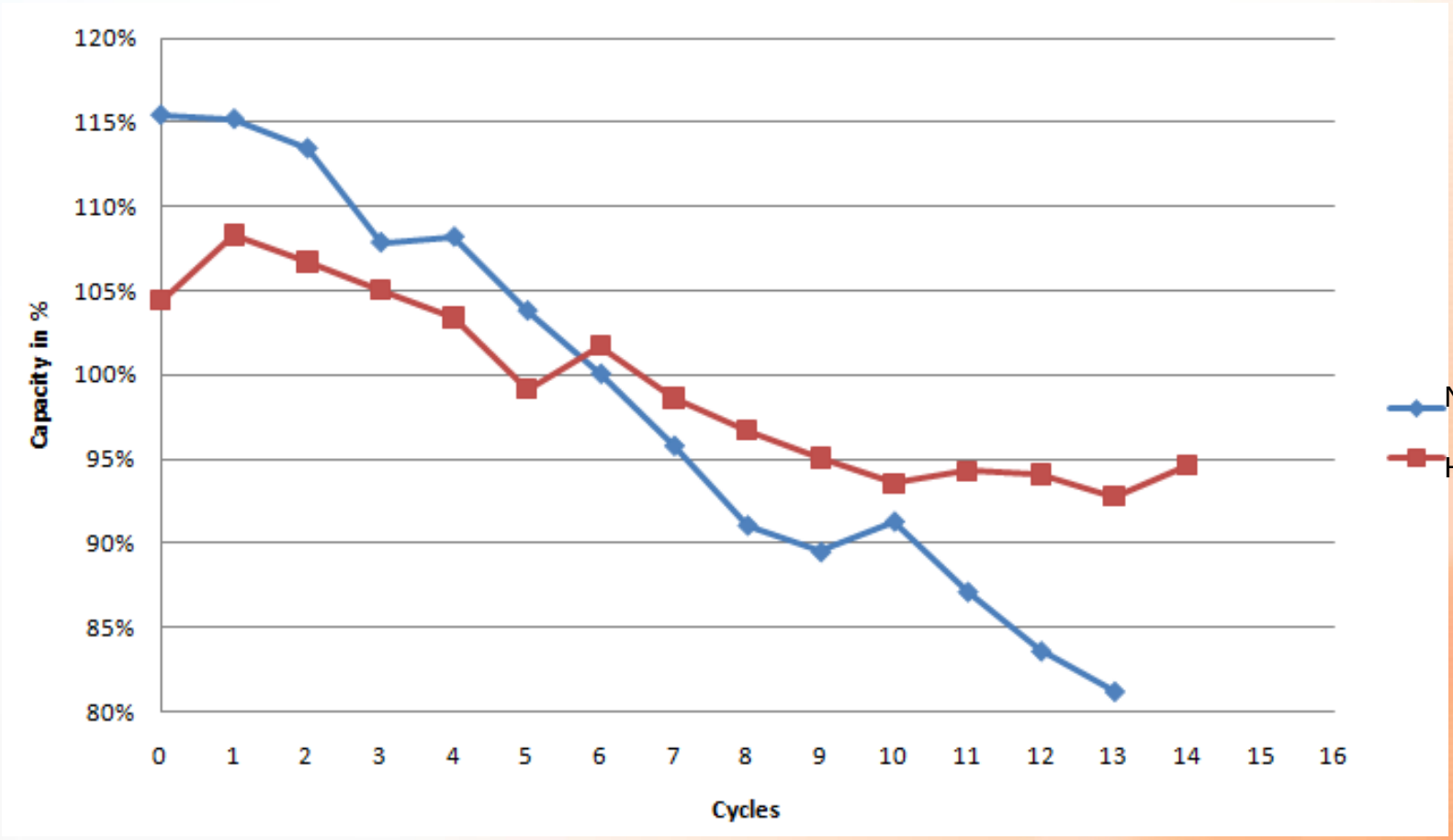


Distortion temperature curve of high temperature material

Technical Improvement

High temp. accelerate test





“Green” Solution – HTB

Benefits:



Environmentally Friendly Solution for on-grid system

* Up to 45%, base station power comsumption saving
* Up to 95%, cooling power comsumption saving
* 80%~100%, A/C operation cost saving
* 66% diesel fuel saving
* 30% carbon emission reduction
* 80%~100% A/C operation cost saving



Environmentally Friendly Solution for Hybrid System

* 56% running time and noise reduction of Diesel Generator (DG)
* 56% increase in DG lifespan
* 12 less service visits for DG
* 66% diesel fuel saving
* 30% carbon emission reduction
* 80%~100% A/C operation cost saving


New Markets
Exploring
New Products
New Industry


Right Message


Teamwork as ONE
Winning The Future Together

Mission

To improve the Quality of life for all people

Through transformation of Energy





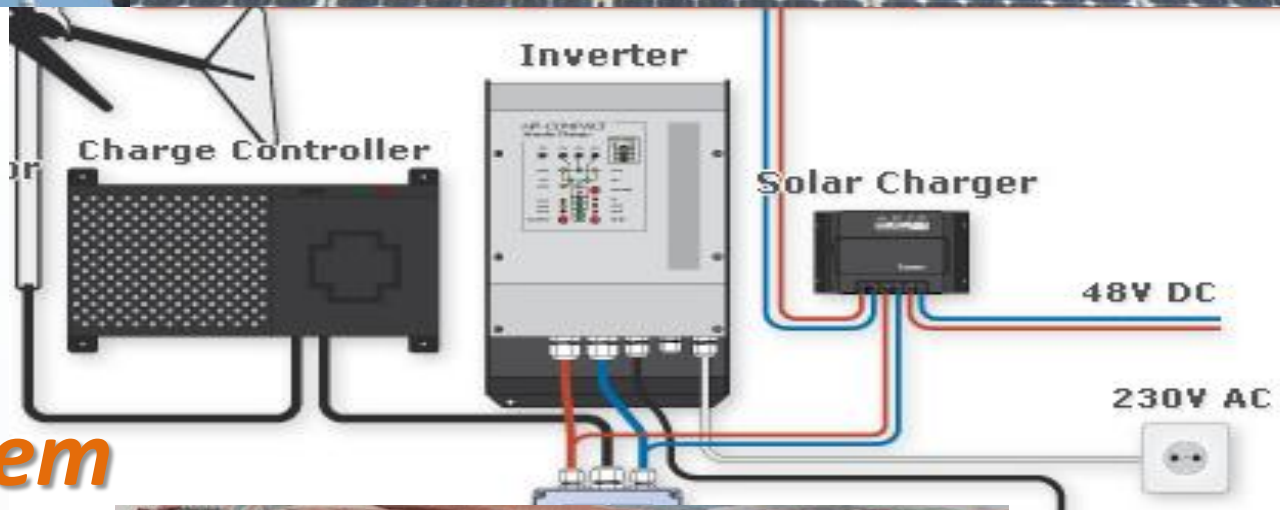
Going Green-



2011







Hybrid System

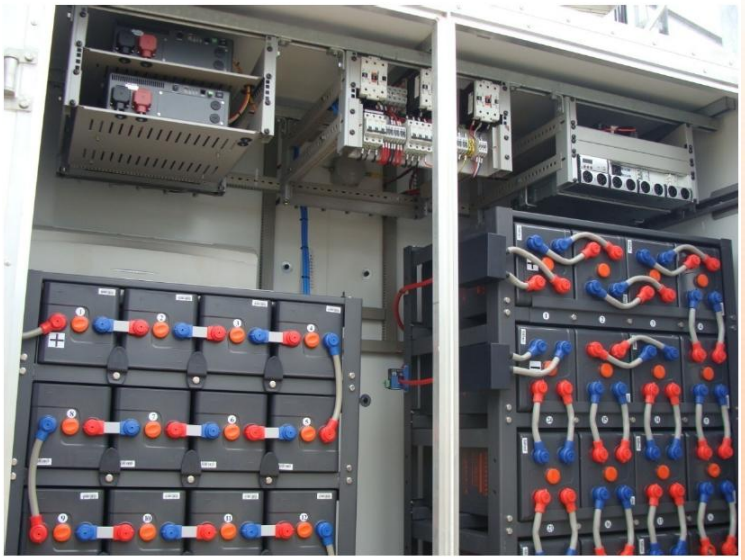






PNG Hybrid Site Photos









Energy Storage- Hybrid Installation









Battery be installed indoor

Energy Storage- Hybrid Installation



Battery be installed under ground





Narada Eos 500

Energy Storage- Hybrid Installation



Bridge base, Qingshui River, 2007



Guoruo Zhiqinxiang base 2007



Yushu malong base, Sichuan, 2006



2409 base, 109 state way, 2008

Energy Storage- Hybrid Installation



Harri, India, Vodafone, 2009



Wind solar system for China Telecom

Energy Storage- Hybrid Installation



Longmen, West Qinghai, 2008



Longmen, West Qinghai, 2008



Energy Storage- Lithium FePo4

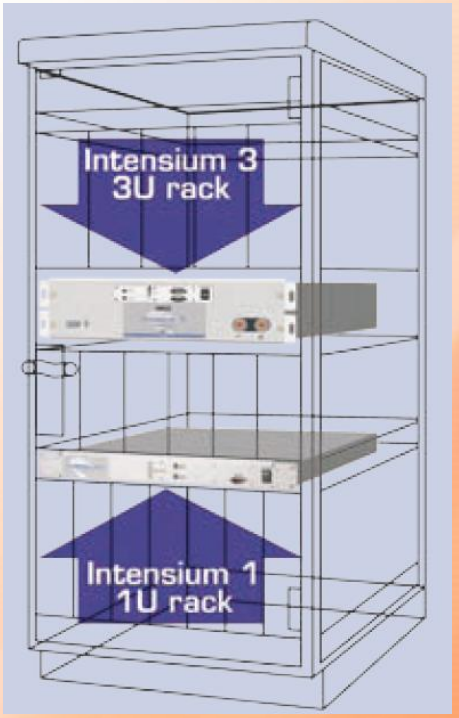




1U：48V/10Ah

3U：48V/50Ah

- 1）Support rack mount ETSI format and wall hang up
- 2）High energy density, total 48V 1U solution
- 3）Parallel applicable
- 4）BMS inside to enhance efficiency
- 5）Protection for over-charge, over-discharge, over-current, short-circuit and over-temperature.
- 6）Support communication and remote monitor

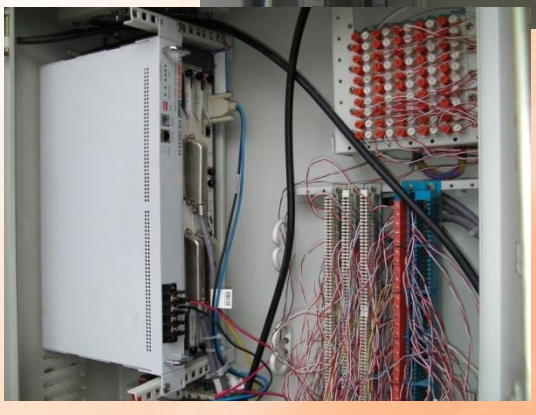


Energy Storage- Lithium FePo4









Narada Care



Narada Care





Narada Care – Community Improvement





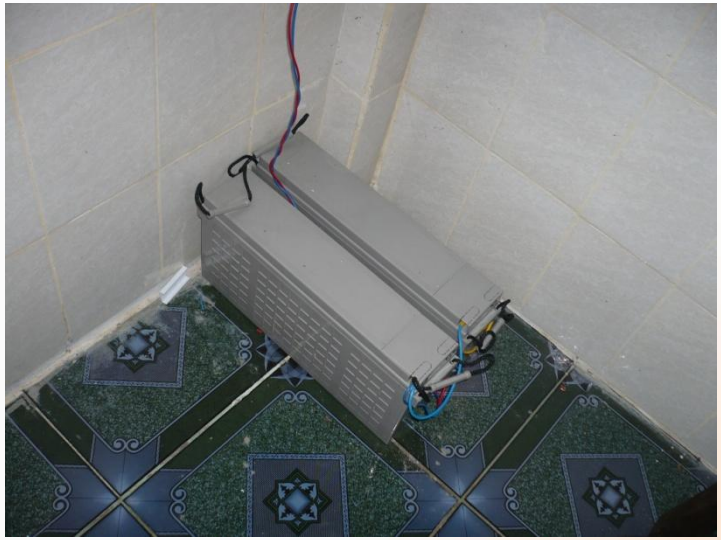




Narada Care – Training









Vision

To be a respected global player for stored energy solutions

