

Smart World Event Conference

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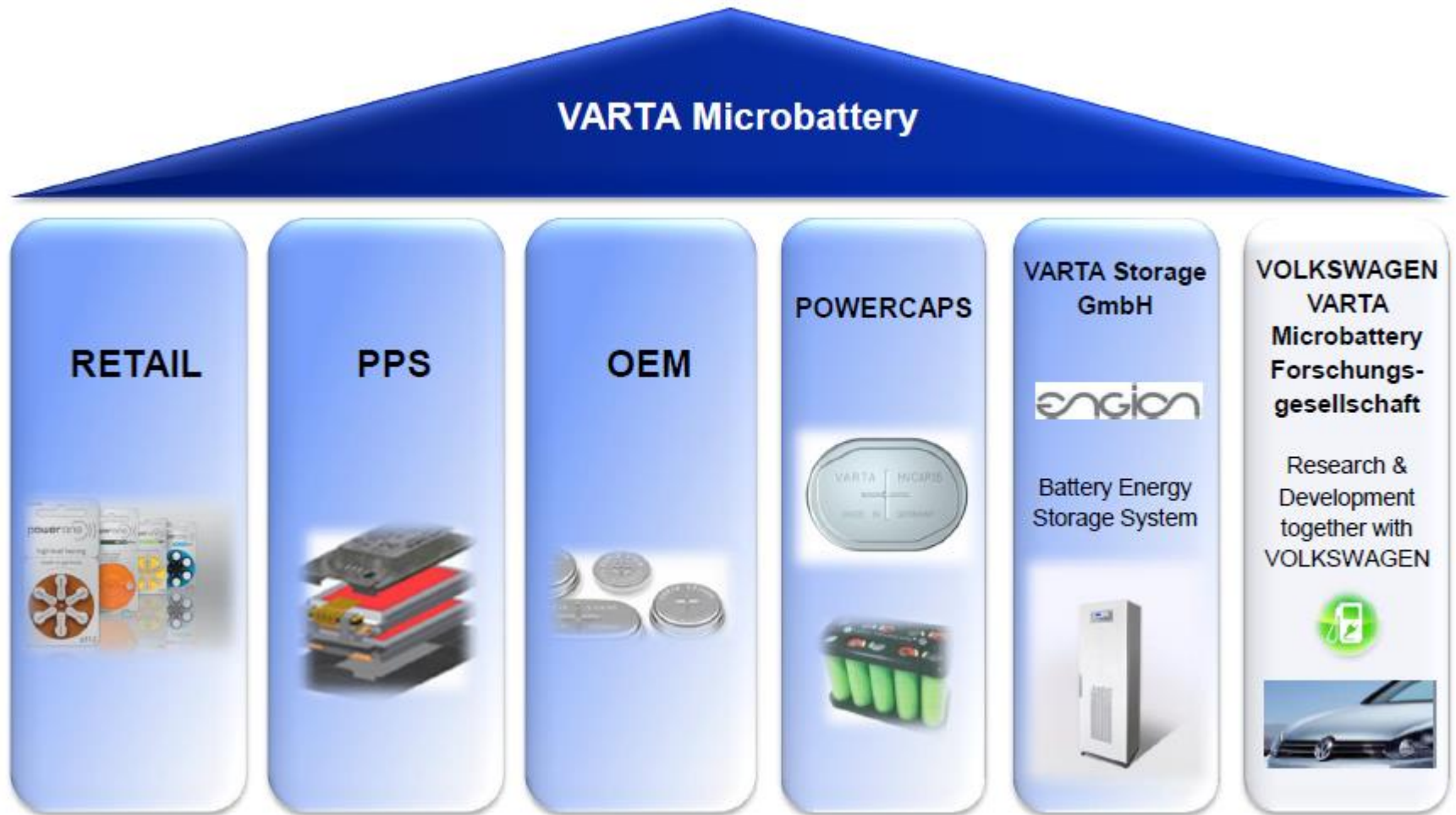
Malmo, Sweden, 16th September 2014



Agenda

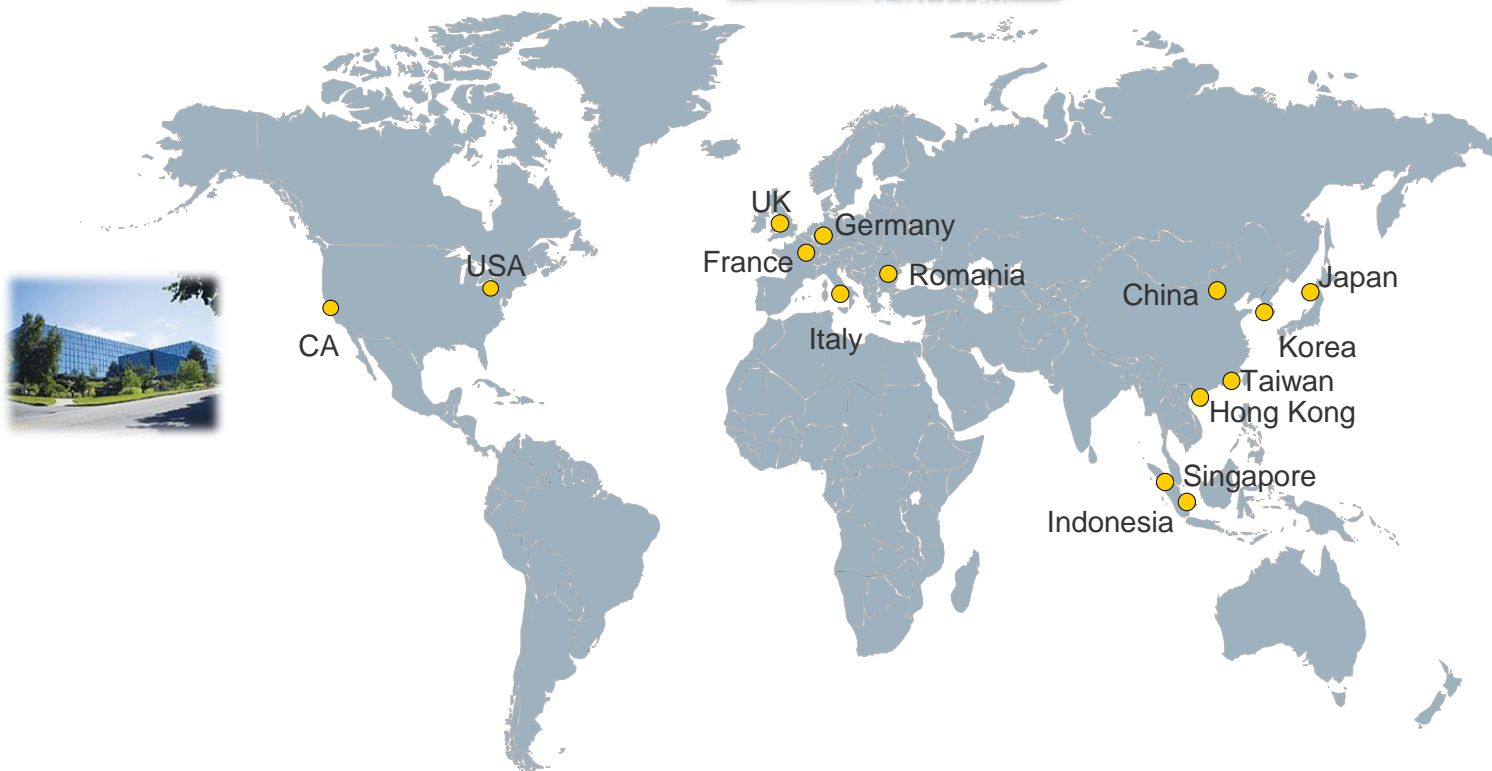
- Brief overview VARTA and products
- Examples for our SMART WORLD today and tomorrow
- A „Smart World“ needs Energy, such as batteries - Are batteries commodity?
- What is important to select the right battery?
- What is new from VARTA for „**Smart World**“ **Devices** ?
- Contact details

Company Structure



Company Network

Subsidiaries and Branches



Key Products

Li-Pol

Li-Ion Prismatic

Li-Ion Cylindrical

Li-Ion Button Cells

Hydrogen Cells

Lithium Manganese

**Lithium Thionyl
Chloride**

Zinc Air

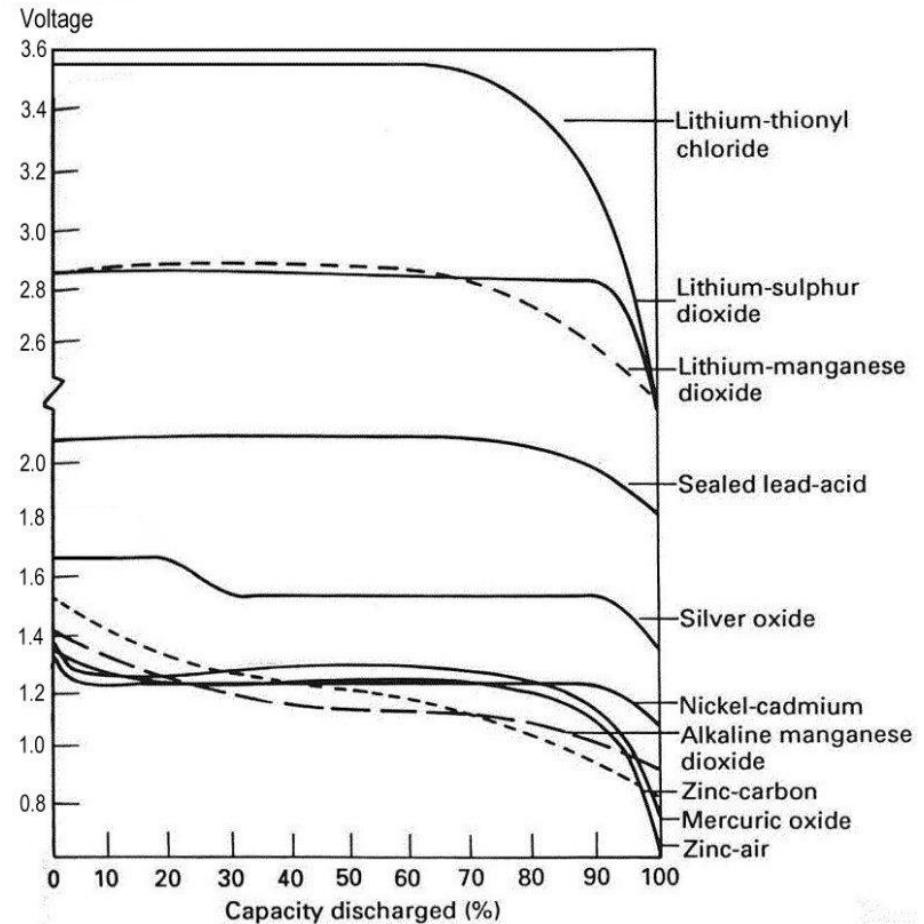
Silver Oxide

Alkaline

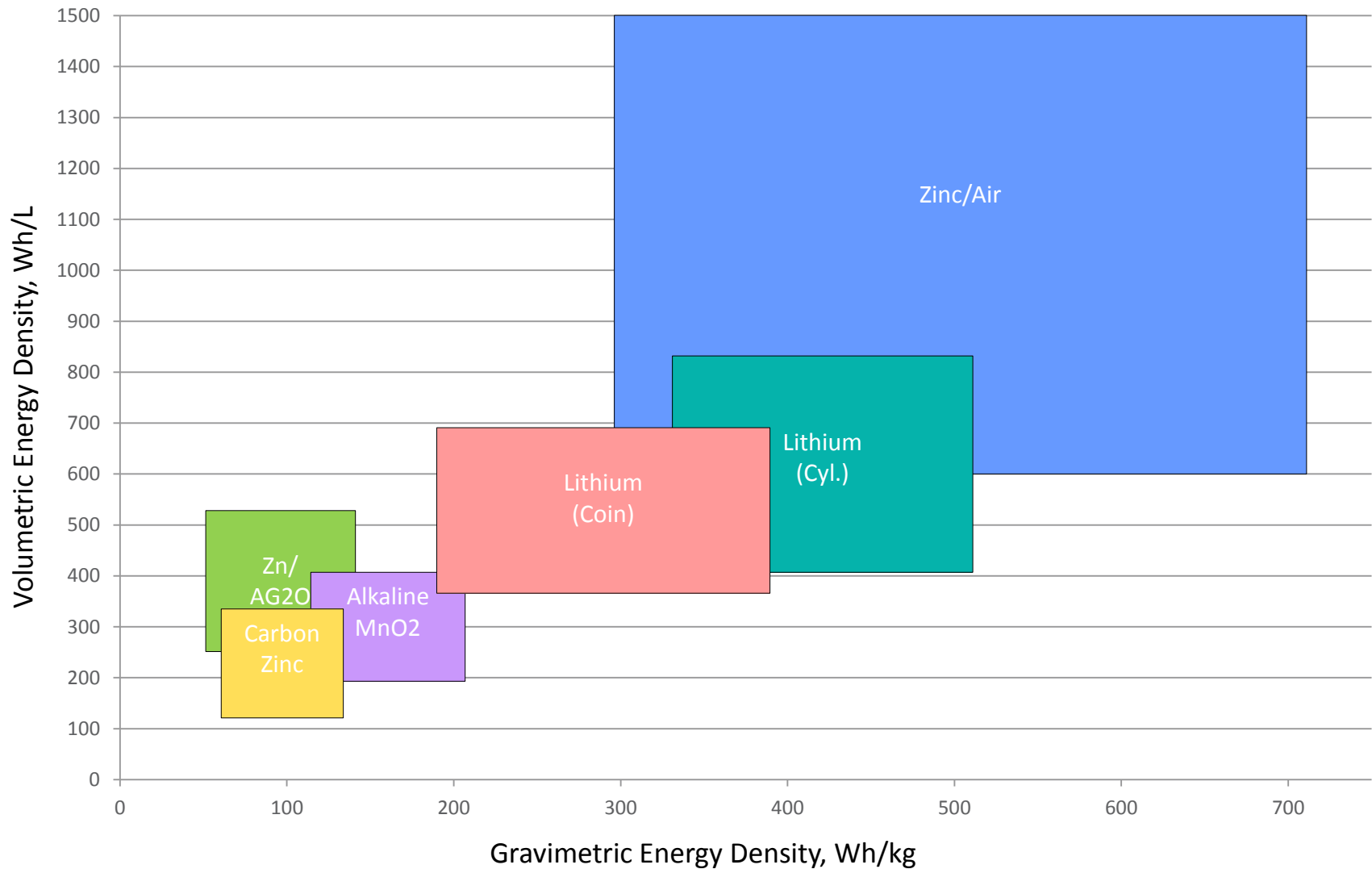
Nickel Zinc

Ni-mH Button

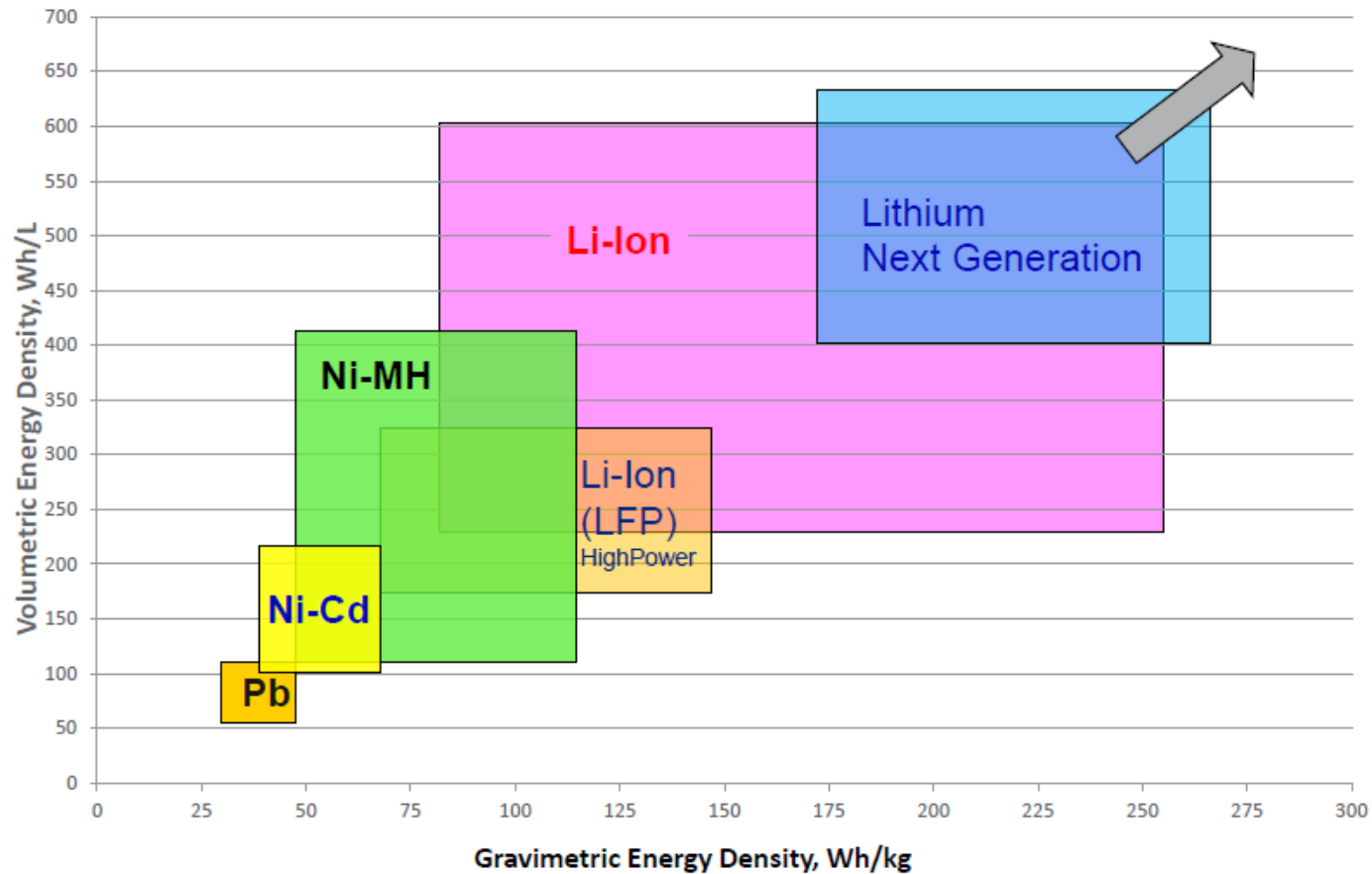
Ni-mH Cylindrical



Energy Density of Primary Battery Technologies



Rechargeable Battery Technologies – Energy Density



A view to the present and future



VARTA Markets – example rechargeable systems - Ni-mH and Li-Ion

- Automotive:

- Car Alarm
- Stolen Vehicle Tracking
- e-call



- Information Equipment

- Server Backup



- Consumer
Notebooks, Wearables,....



VARTA Markets – example rechargeable and primary systems

- Remote Control
- Memory Back-Up (MBU)
- Real Time Clock (RTC)
- Home Intelligence
- Metering
- Toll Collect devices
- Bicycle Computer
- Watches
- Medical Devices



Are batteries a commodity?

No! → Batteries are a key component for OEMs!

Market success of many devices in various industries depend on excellent batteries

To a large extent batteries define duration, shape and size of modern, portable electronic devices

“Design in” is important, because battery know how is not widespread in the electronics industry

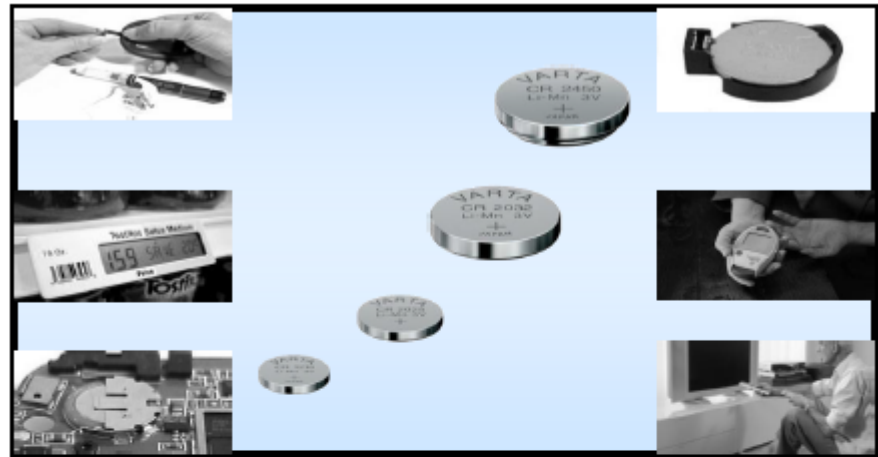


Battery Selection – what is key to selectig the right battery?

This list is not complete!

What are my application requirements?

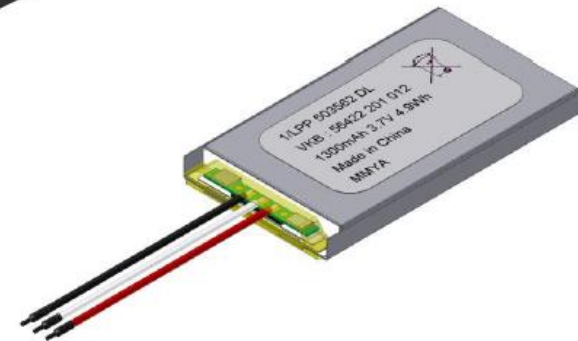
- Space?
- Size?
- Weight?
- Temperature (operation, storage,...)?
- Electrical Requirements?
- **Min./Max. Voltage?**
- Power? Current? Sleep mode / Operation? Continous discharge? Standby?
μW or MW?
- Pulse load? Min. / Max. Pulse for which “time slot” (pulse profile)?
- Which running time is required, for which time frame (per day/week/month) ?
- Which lifetime is expected?
- Which approvals / conformity are needed?
UL? IEC ? ATEX?



Examples of rechargeable systems



Batteries for GPRS and WLAN systems
from 40mAh to 2600mAh



Li Ion Secondary

What is new from VARTA for Wearable Devices?

Product of the Year 2012!



TOP 100 innovation award of the year 2011



What is Coin Power?

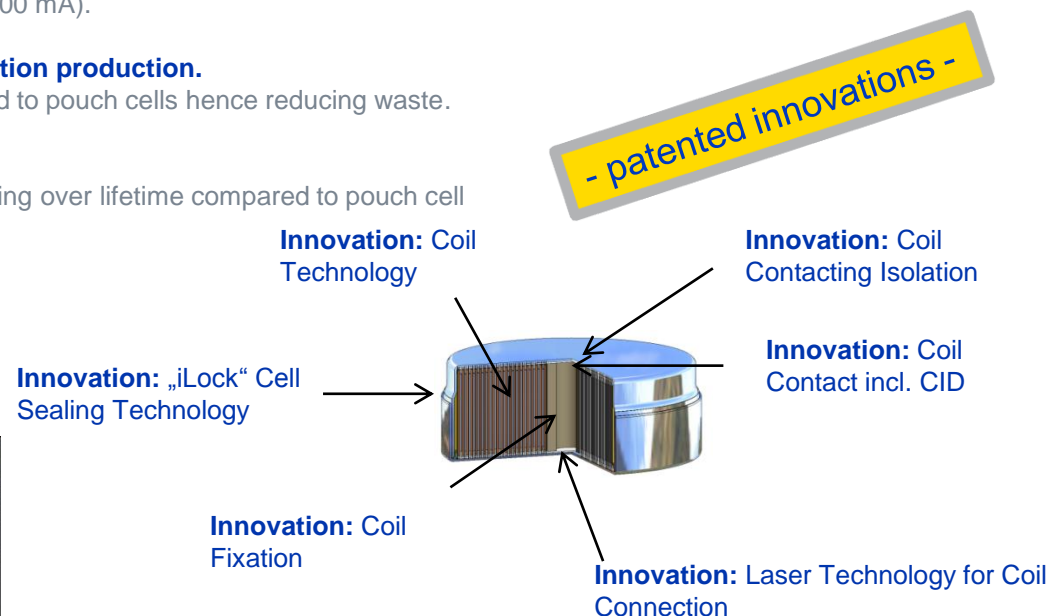
Characteristics

- Volume: **0.6** – 2 cm³
- Size: 12 mm – 20 mm diameter, 5mm height
- Technology: Li-Ion rechargeable
- Voltage: **3.7V**
- Capacity: **40 – 150 mAh @ 1C-rate !!!**
- Cycles: **>1000 cycles !!!!**
- Weight: **1.4g !!! - 5.0g**

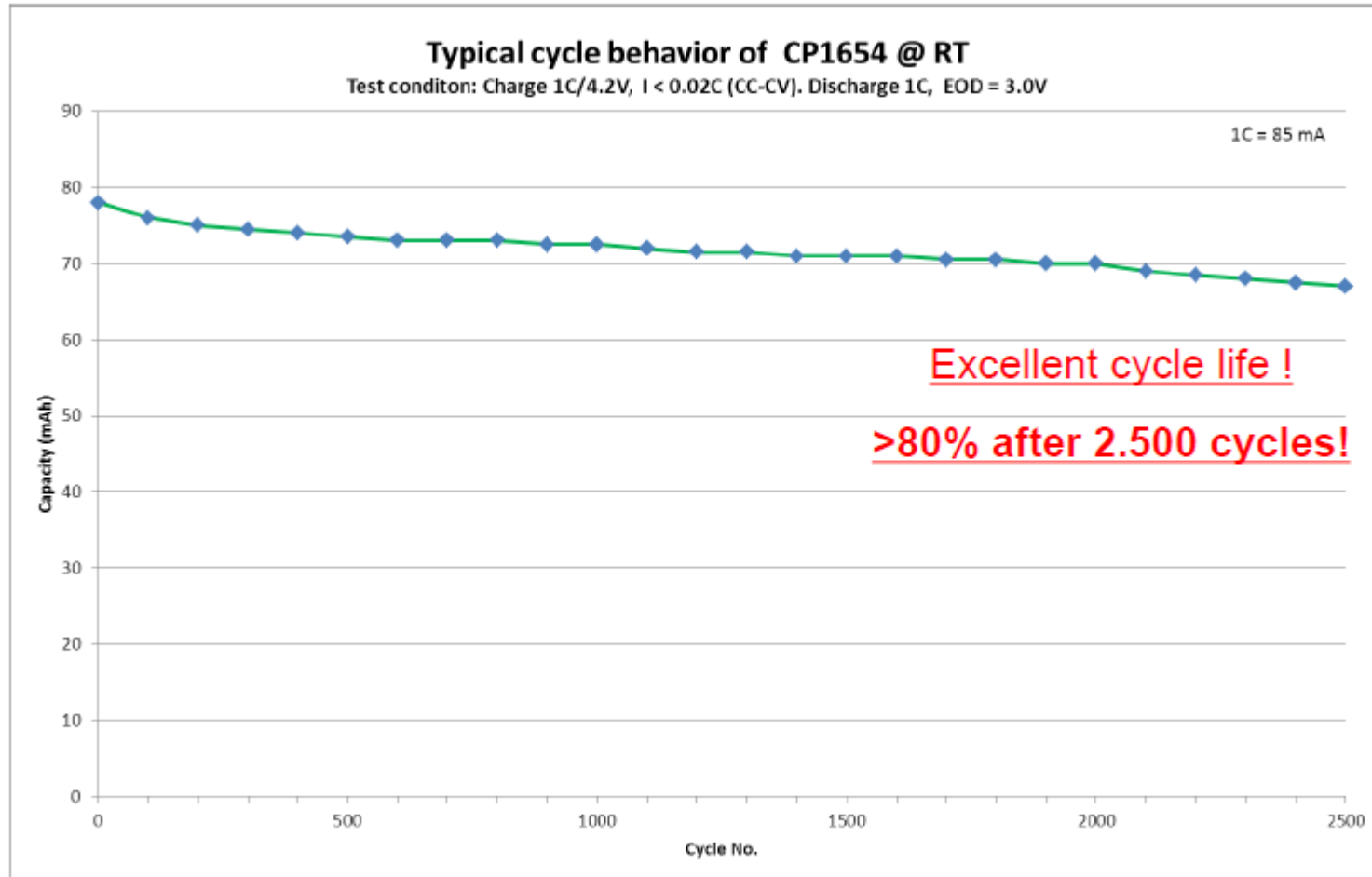


The Benefits of CoinPower

- Best-in-class product life to benefit your customers.**
 Exceptional life time >> 2500 FULL cycles @ 80 % of initial capacity.
- Smaller designs and lighter products for end-users, increasing comfort.**
 Patented iLock system and efficient circular form factor provide the highest energy density in the market today (10 – 30 % higher energy density vs. all other small lithium-ion competitors in the micro battery market).
- Charge for a moment, use for hours...ready-to-go in 20 minutes.**
 Fast charge capability (multiple C-rate charging possible).
- Top quality performance for audio or wireless/radio signals.**
 High drain capability delivers up to 5 x cell capacity (400 mA).
- Cost savings on your assembly stage of the application production.**
 Hard steel case is highly resistant to damage compared to pouch cells hence reducing waste.
- Simplified design process saves time and money.**
 Steel Case Design also means practically ZERO swelling over lifetime compared to pouch cell equivalents.



CP1654: 1C/1C cycling @ 21 deg C



A smart man in the electronic industry once said:

“ in modern electronic devices there are 3 key components:

the chips are the brain,

the displays are the face

and the BATTERIES are the heart! ”

Take care of YOUR heart !

Thank You!

Thank you!

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