aggreko

STROMMARKTTREFFEN BERLIN

Development of Li-Ion battery market

BATTERY TECHNOLOGY - MICHAEL SCHREIEDER

MAY-2019

AGGREKO KEY FACTS



- temporary power generation equipment
- temperature control equipment
- headquarter in Glasgow, UK
- 9,920 MW fleet
- 1,720m £ revenue
- 208 location worldwide
- 6,000 employees
- 124 counties where we operate



AGGREKO MICROGRID AND STORAGE - AMSS



- Younicos -> AMSS
- ESS products and projects
- Hardware and software products
- ON and OFF grid applications
- Main components
 - Thermal generation



- Renewable s (Solar / Wind)
- Battery Storage
- Software plattform











Our Products

The products we use are much more than big boxes - they power cities, they cool rockets and help communities thrive.

Power

Whether a developing country is seeking a multi-megawatt power plant while a permanent grid is established, or a small entertainment company wants to put on a local event with the help of reliable rental power, we have the experience and know-how to get the job done.





Heating & Cooling

When it comes to temperature control, we're the ones you want on your team. Because we're also experts in providing stable, ambient temperatures for all types of industry and circumstance essential for health and working conditions - and to enable operations to run safely.

Battery Storage

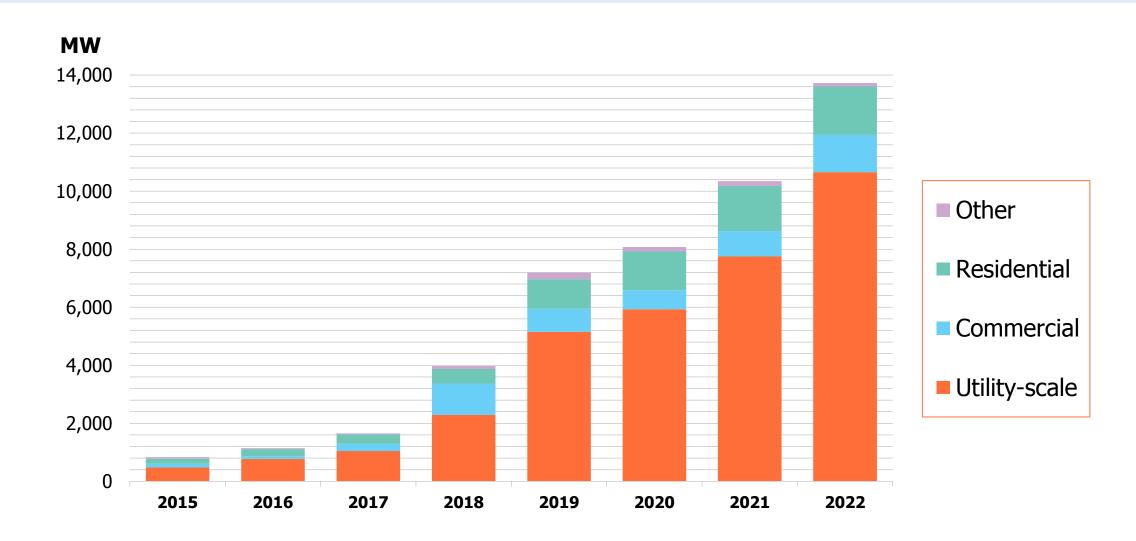
Our fully integrated, plug-and-play battery storage solutions ensure maximum system effectiveness and efficiency. They have been optimised across every component to deliver optimal system performance, minimise operating costs and shrink your carbon footprint.





GLOBAL STORAGE DEPLOYMENTS



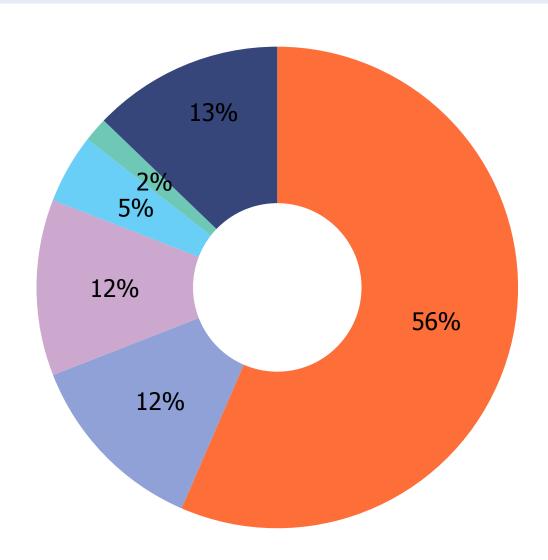


GLOBAL STORAGE PRODUCTION





- USA
- South Korea
- Europe
- Japan
- Other



FROM CELL TO ESS

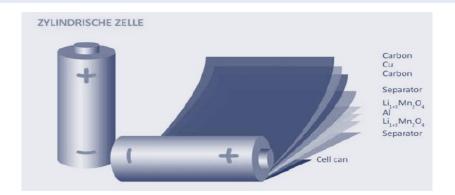


DC Container Module Rack Cell **cost structure LiB battery** products Cell ■ Module Rack Container

TYPES OF LITHIUM ION CELLS

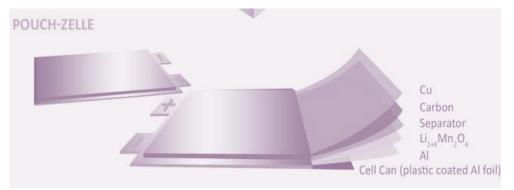


Cylindrical

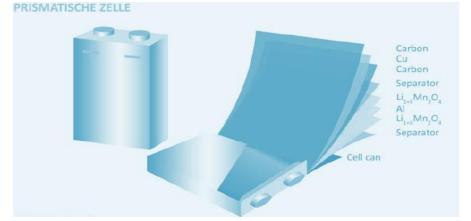


IFR 19650 1500mAh 3.20

Pouch



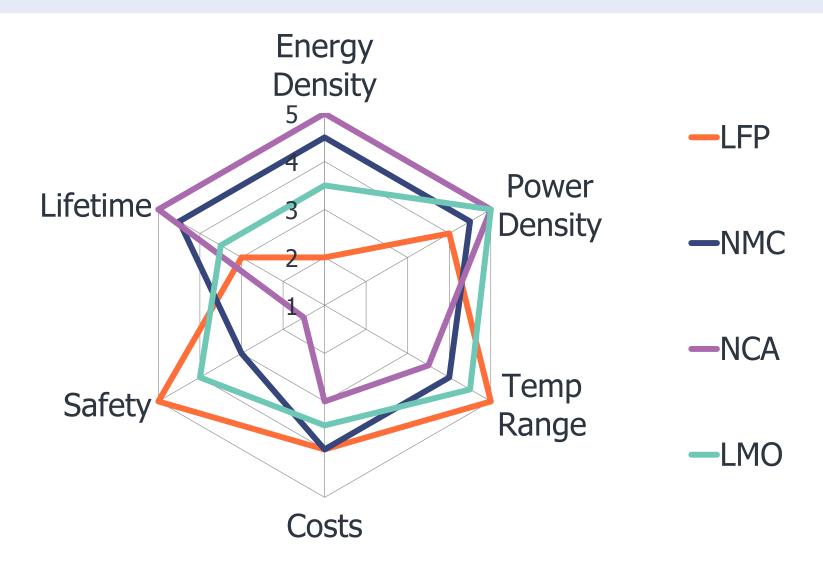
Prismatic





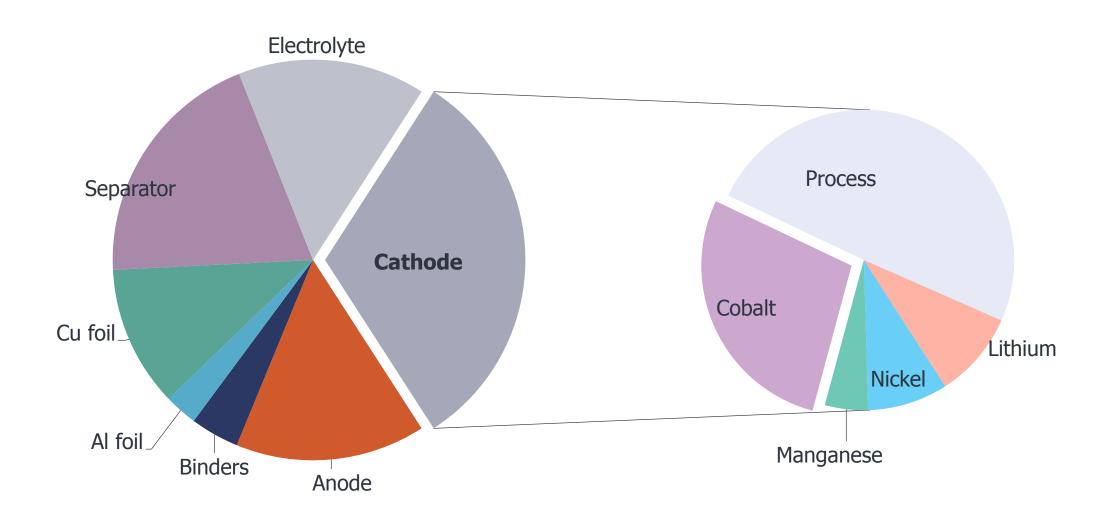
DIFFERENT CHEMISTRIES





SPECIFIC COSTS BATTERY CELL NMC





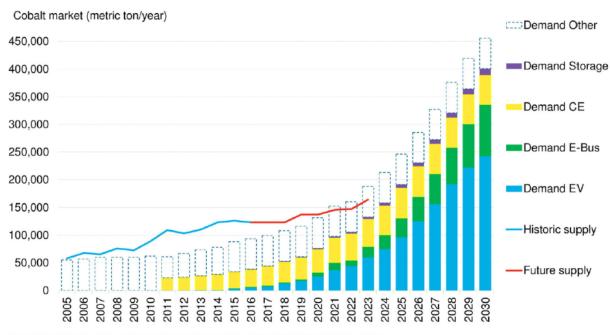
LITHIUM AND COBALT



Lithium supply and demand

Lithium market (metric ton/year) 300,000 250,000 200,000 150,000 100,000 0 100,000 0 100,000 0 100,000 0 100,000 0 100,000

Cobalt supply and demand

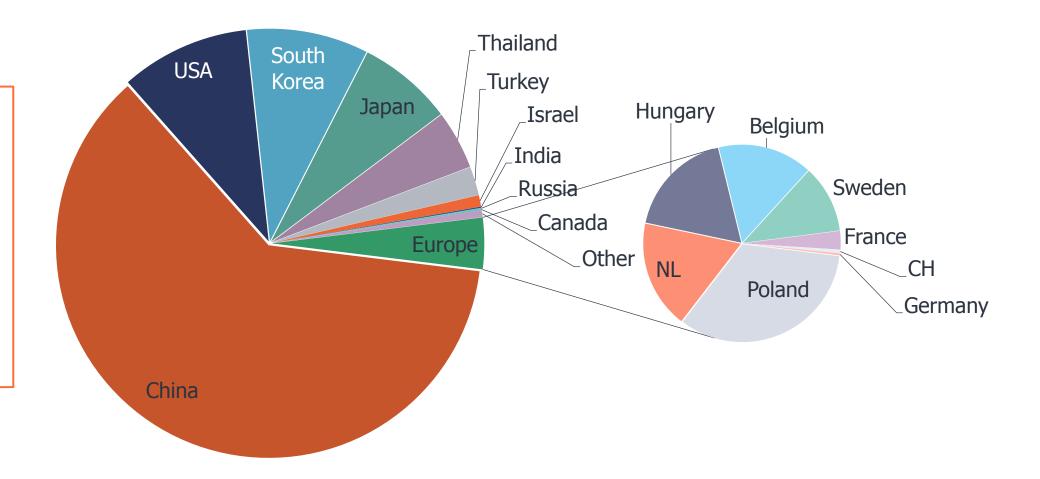


Source: Bloomberg New Energy Finance, press releases, Avicenne, USGS, IDTechEX, Deutsche Bank

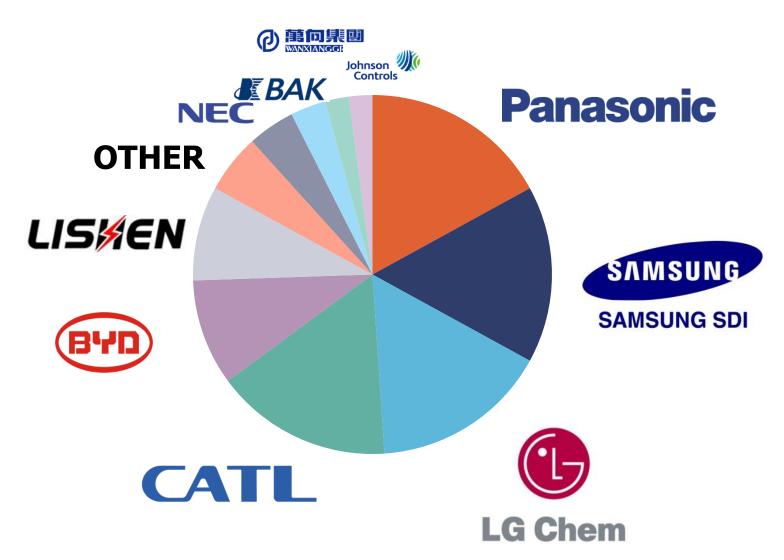
GLOBAL LI-ION PRODUCTION



- global production of Li-Ion batteries per country
- including currently commsioning factories

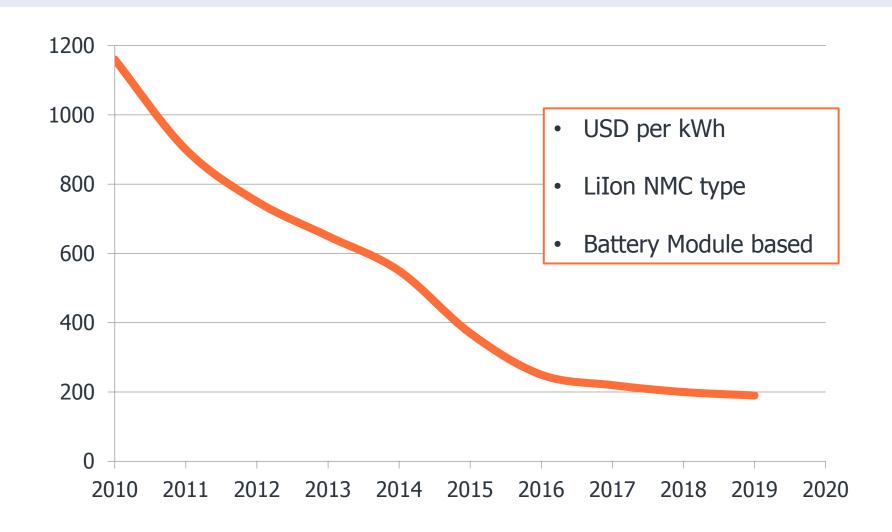






BATTTERY PRICE DEVELOPMENT

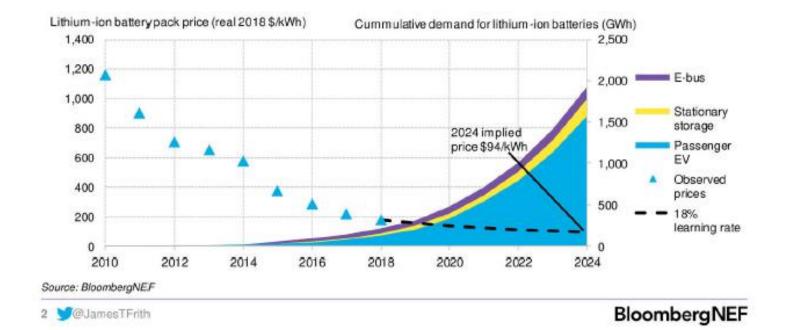




OUTLOOK LI-ION MARKET



- prices will stay arround 150 \$/kWh for ESS
- difference between EV and ESS market
- local production will rise
- China dominant player



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Thank you for your attention!

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