

**NEW TECHNOLOGY DIVISION:
WE ARE THE
POWERHOUSE
OF VOLKSWAGEN**

**Thomas Schmall
Member of the Volkswagen AG Board of Management | Technology
March 16th 2021**

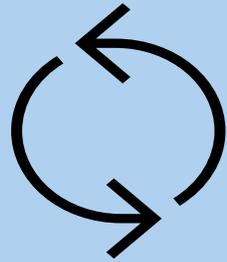
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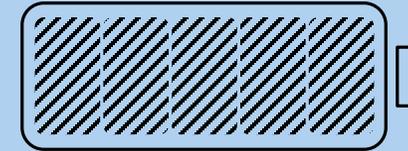
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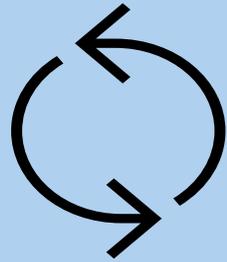
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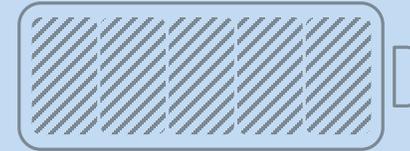
**TRANSFORMING
GROUP COMPONENTS**



**BUILDING A
POWERHOUSE**



**TRANSFORMING
GROUP COMPONENTS**



**BUILDING A
POWERHOUSE**

Cross-sectional functions within the Group

Harnessing synergies and scale



VOLKSWAGEN
AKTIENGESELLSCHAFT

Charging and energy

Battery cell and system

Drivetrain and platform

...

The path to Volkswagen Group Components...



Reshaping product portfolio to become future proof

More **focus** on
ICE products



Looking for
partnerships
to **strengthen**
businesses



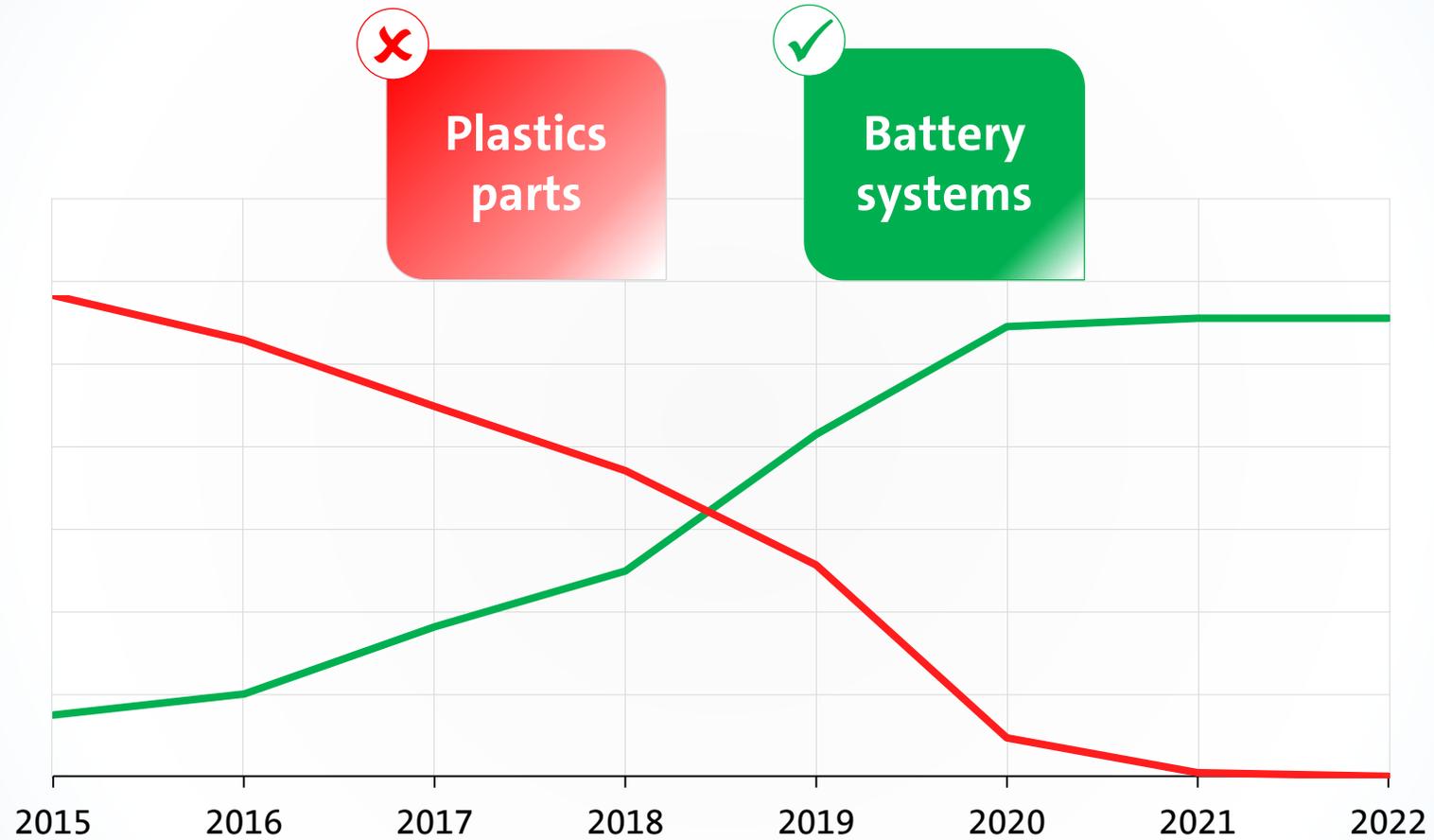
Phase out of
non competitive
products



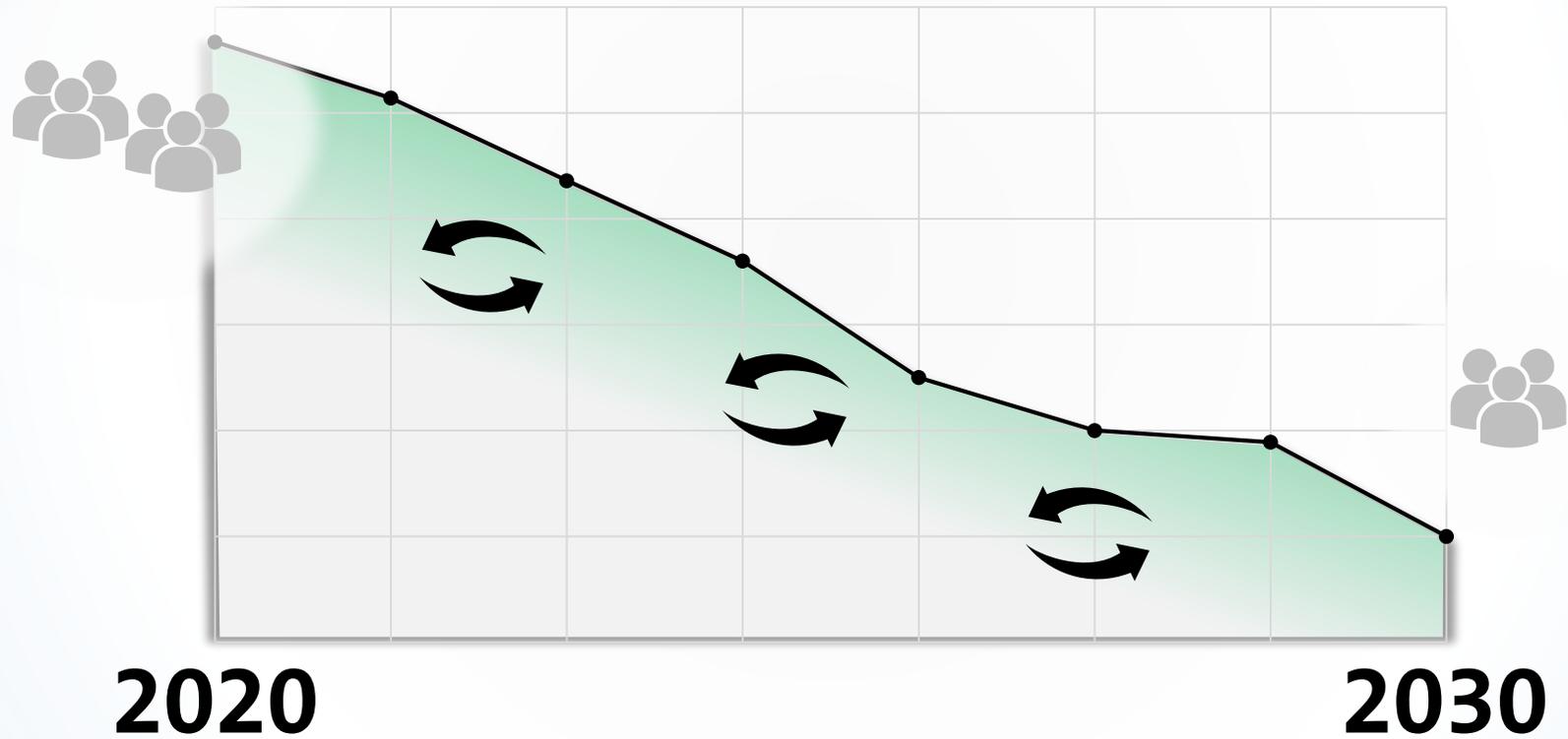
**New
business**



Transformation can also support maintaining jobs

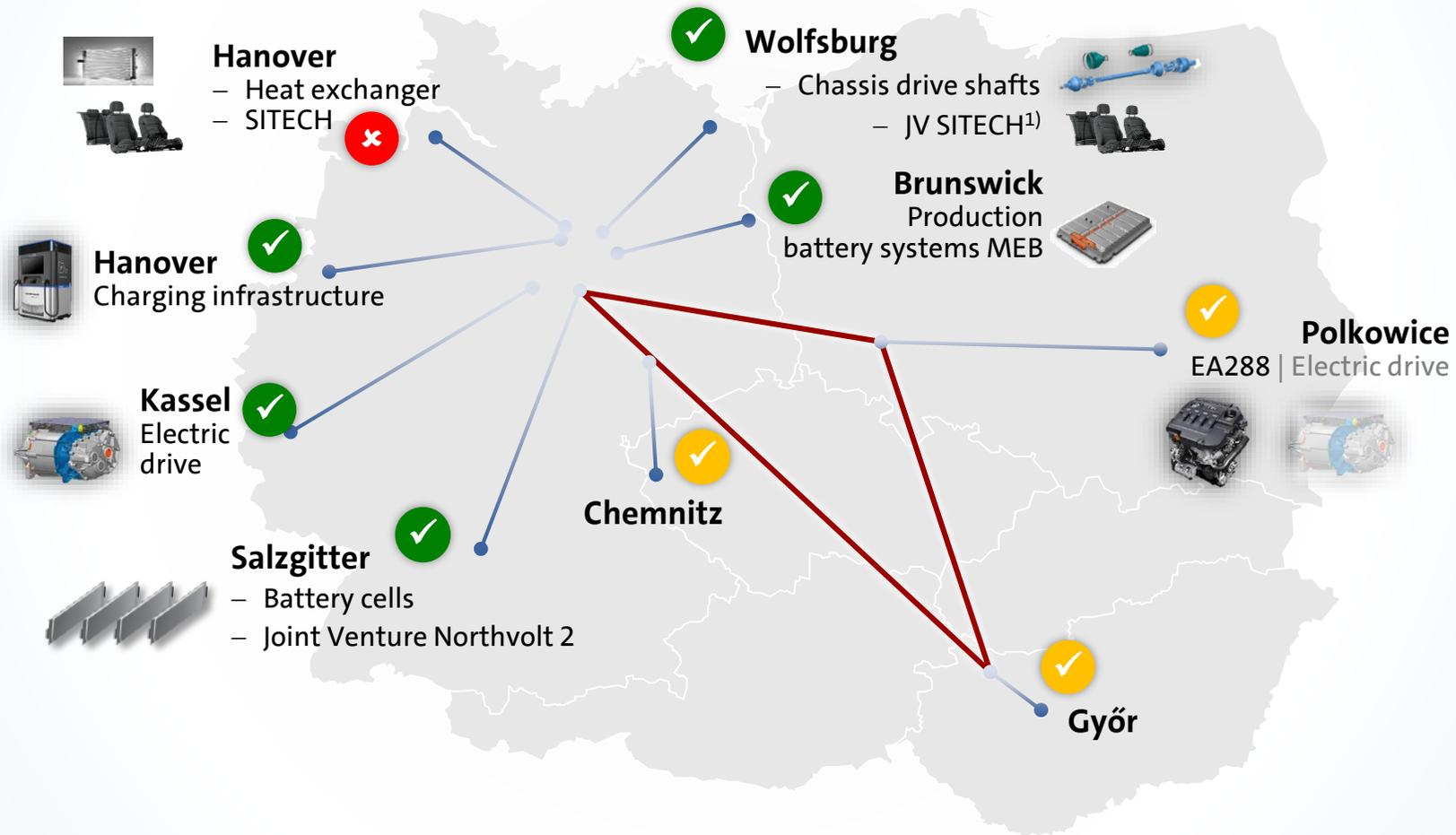


Transforming the entire value chain can be achieved using the demographic curve



1) German component plants, direct staff

Transformation map of the component plants



1) Deconsolidation of the Volkswagen Group; Joint Venture is in phase "due diligence"

Better cost positions due to reduced complexity and focus on value added

BUSINESS UNIT CHASSIS & BATTERY SYSTEM



BUSINESS UNIT GEARBOX & ELECTRIC DRIVE



ID.4 1ST Max - Electricity consumption (NEOC), kWh/100 km:
16,2; CO₂ emission in g/km: 0; Efficiency class: A+

BUSINESS UNIT ENGINE & FOUNDRY



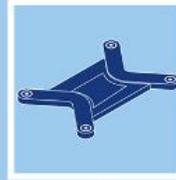
Strategic development of Group Components to a third party supplier

COMPONENTS INVOLVED IN THE MEB COLLABORATION

CHASSIS & BATTERY SYSTEM



Shock absorber
Braunschweig



Support frame
Braunschweig



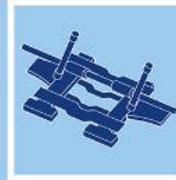
Coverage for rear axle
Braunschweig



Drive shaft
Wolfsburg



Wheel drive
Braunschweig



Coverage for front axle
Braunschweig



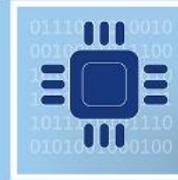
Steering system
Braunschweig



Brakes
Braunschweig



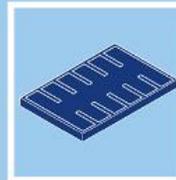
Swivel bearing
Braunschweig



Hardware and software
Braunschweig



Battery housing
Braunschweig



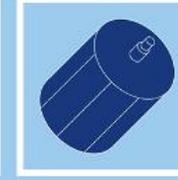
Battery system
Braunschweig

(BASIS ID.4)

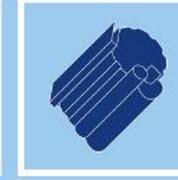
ENGINE AND CASTING



Gearbox housing
Poznan



Intermediate housing
Kassel



Engine housing
Hanover



GEARBOX AND ELECTRIC DRIVE



ZSB electric drive
Kassel



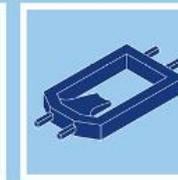
Electric engine
Kassel



Stator
Salzgitter



Rotor
Salzgitter



Press parts
Kassel

INNOVATIONS made by...



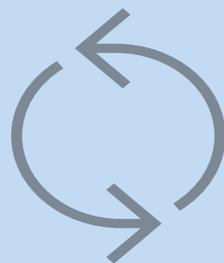
Mobile Charging Robot



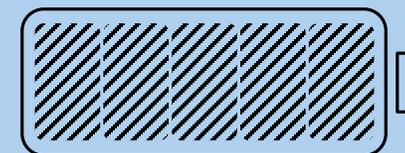
DC-Wallbox



Flexible Charging Pile



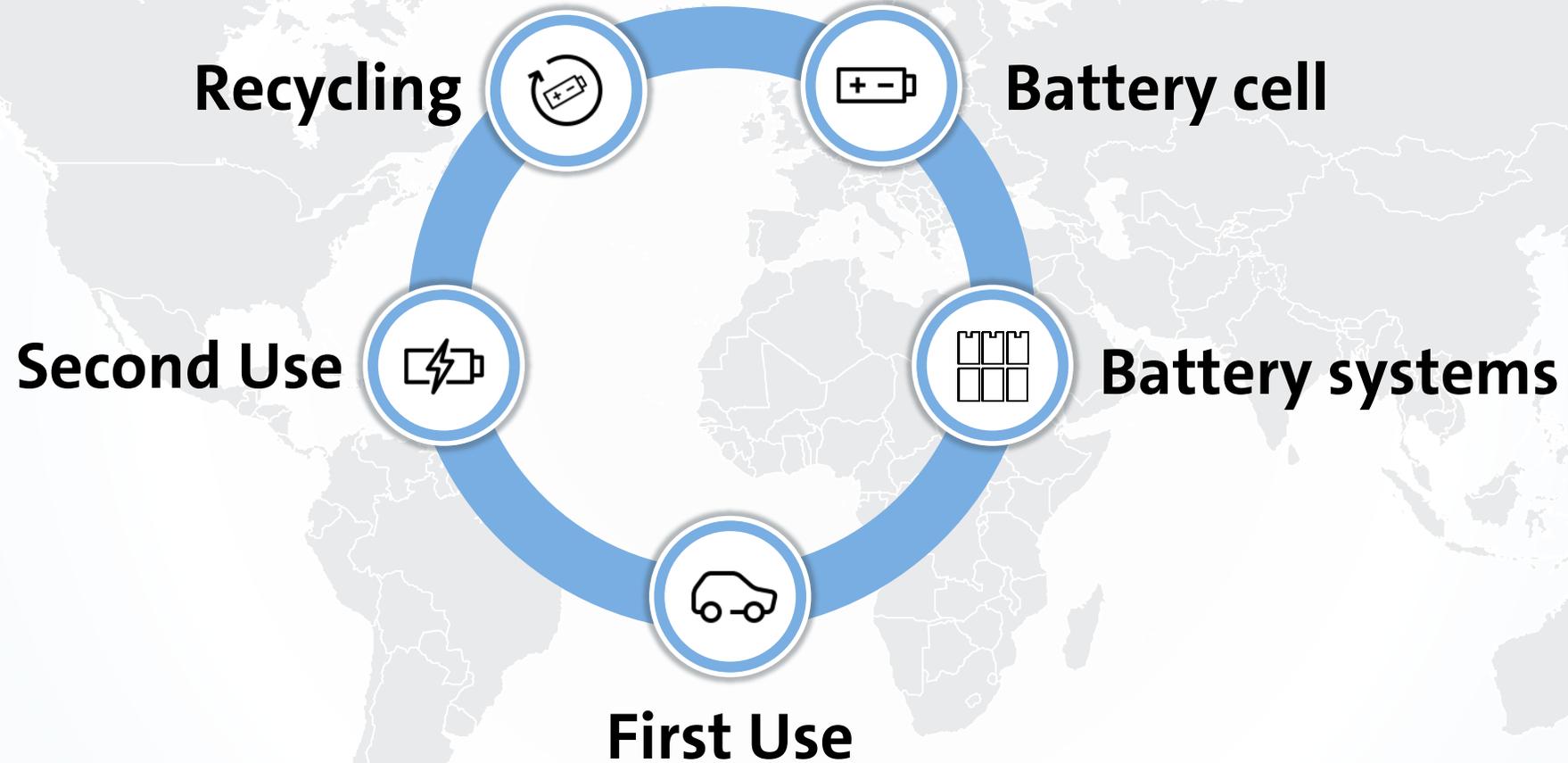
**TRANSFORMING
GROUP COMPONENTS**



**BUILDING A
POWERHOUSE**

Mindset change in functional responsibilities

Closed Loop approach!



FUNDAMENTAL MINDSET CHANGE

Current approach

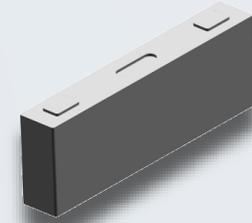
1st



2nd



Unified Cell

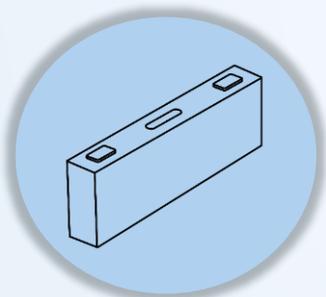


Reaching cost targets with unified cell concept

Entry

Cost
-50%

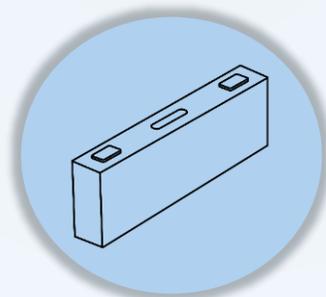
Inexpensive chemistry



Volume

Cost
-30%

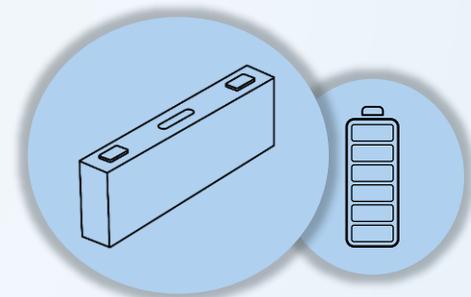
Mainstream chemistry



Specific solution

Cost
-xx%

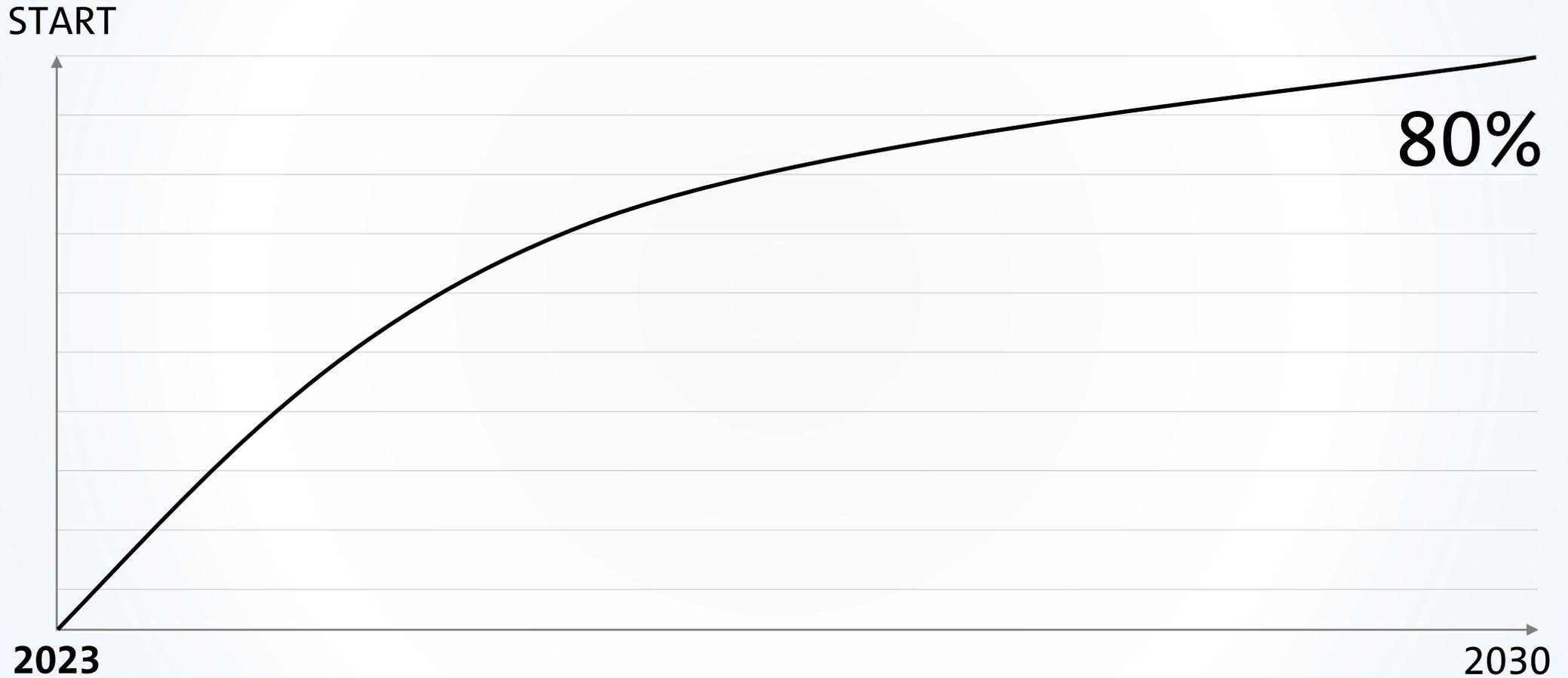
High end chemistry for
high performance



VARIETY IN CELL CHEMISTRY

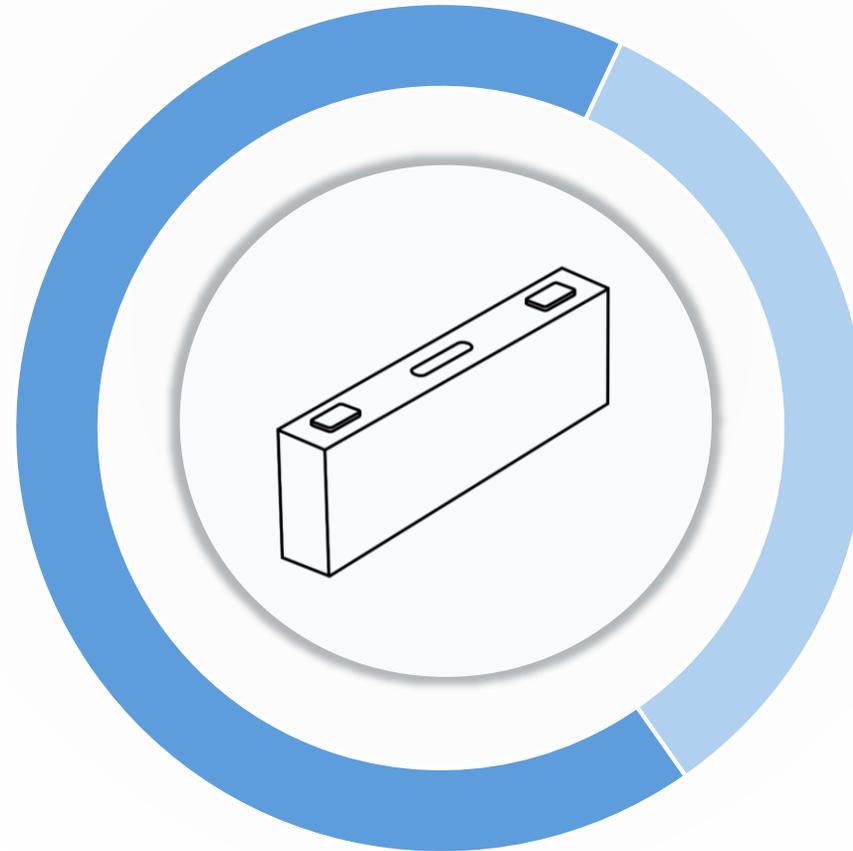
VARIETY IN CHEMISTRY AND DESIGN

Actual product portfolio shows possible unified cell utilization of 80%



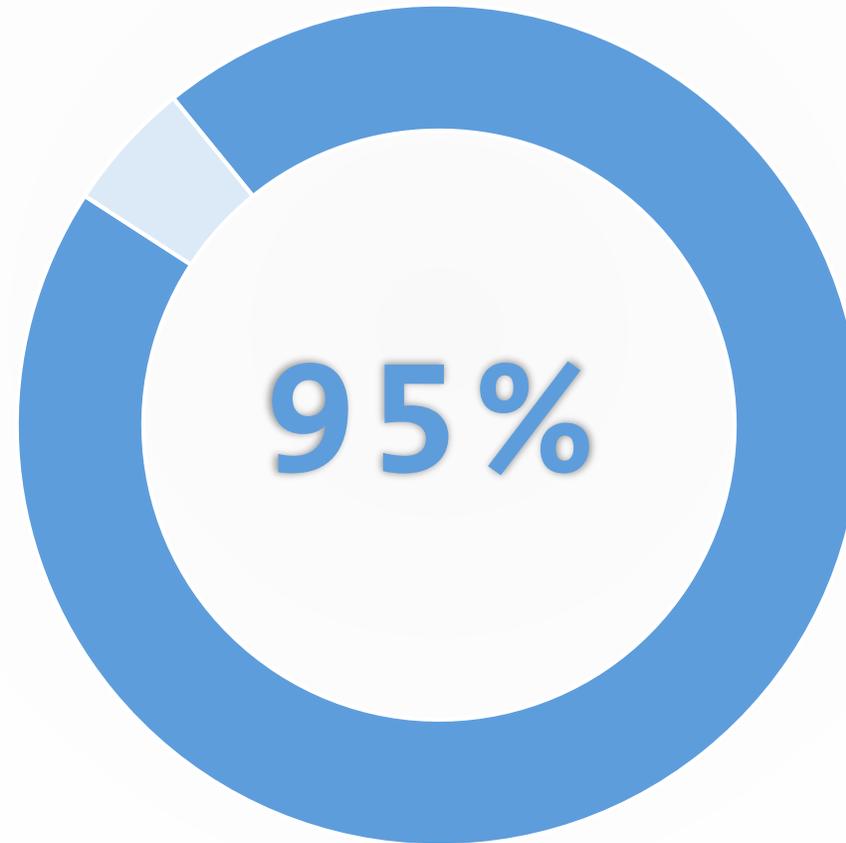
Cost-spread unified cell

2 / 3
Chemistry

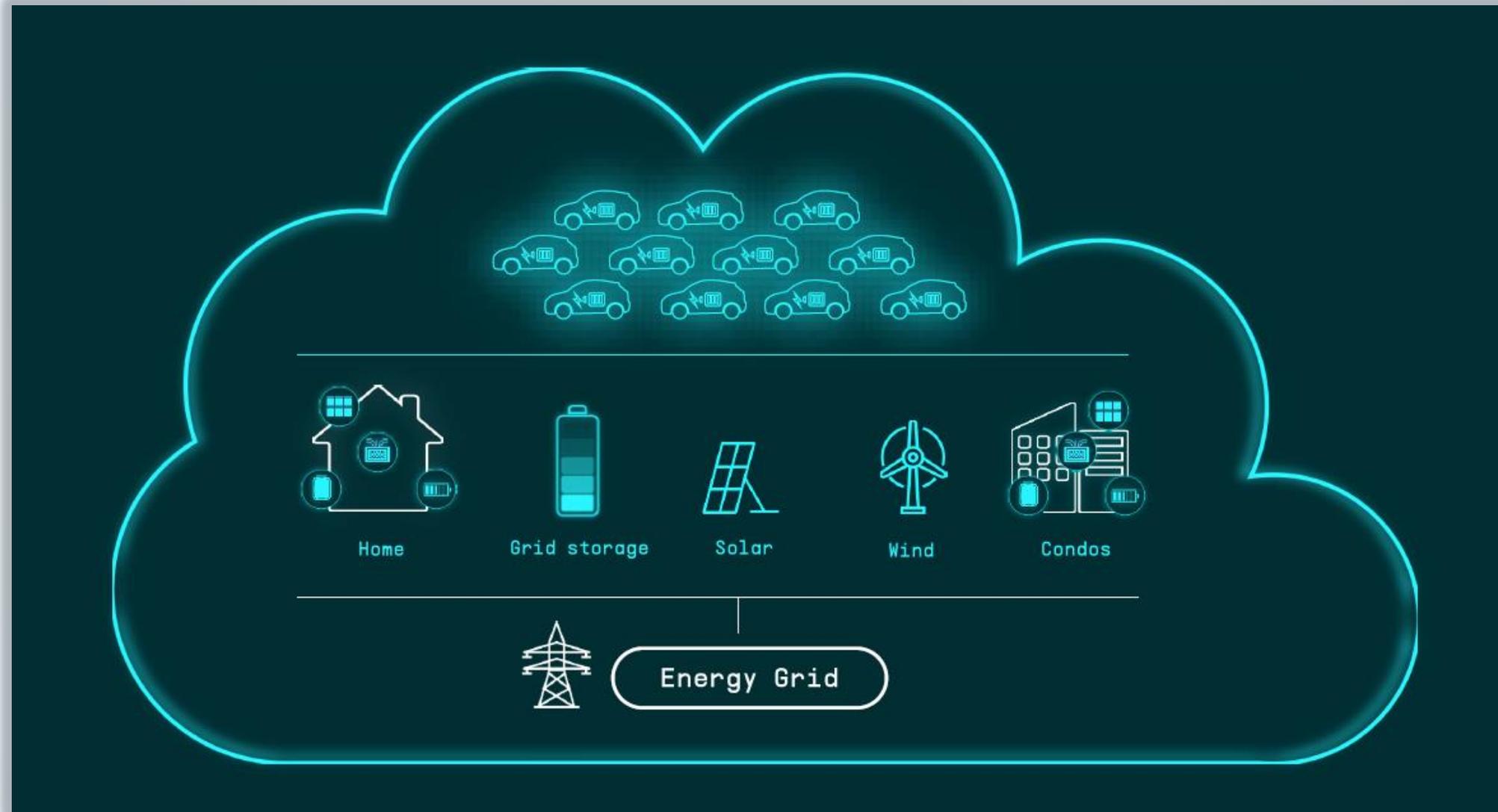


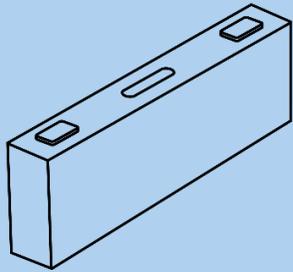
1 / 3

Reusing 95% of the raw materials through Hydrometallurgy process



Energy integration: Fully digital and data driven

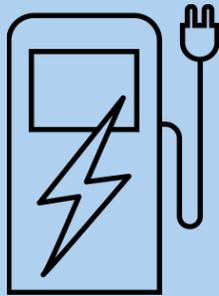




BATTERY CELL AND SYSTEM

- **Technology roadmap** with possible unified cell utilization of 80%
- Action fields to **achieve cost targets** defined
- **Closed Loop** process installed
- **Solid localization strategy** to secure volume and timing

Key Takeaways (2/2)



CHARGING AND ENERGY

- **Global Boost-Plan** for charging infrastructure
- Expand fast charging points in **strong partnership with local partners**
- The car will be a **part of the energy eco system**
- **Storage systems** to facilitate fluctuating renewable energy supply
- **Energy management as new business opportunity**