



12V Battery for Automotive

Technologies, requirements and integration from a carmaker standpoint

ALBA conference, Mainz 19-20 May 2026

Stellantis

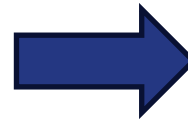
Lorenzo Zolin



KEY POINT ON 12 V BATTERIES



YESTERDAY: Commodity component



TODAY: Strategic Enabler

IMPACTS

Packaging

Architecture design

Customer experience

Vehicle reliability



Safety concept
(along with BMS)

Energy needs

Power needs

Characteristics	Lead acid	Li-ion	Na-ion
Industrial maturity	✓ ... Ehm well	✓ High and growing	✗ Low-medium
Weight and size	⚠ Penalizing - Low gravimetric energy (13kg @ 40Ah to 26 @105Ah)	✓ Significant benefit - High gravimetric energy (4kg @ 20Ah to 14 kg @ 80Ah)	✓ Potential benefit
Packaging	? EN-shape	? Customized shape / <65°C - Allow “flat” shape - Cannot be installed underhood	? Customized shape / <65°C - Allow “flat” shape - Cannot be installed underhood
Field lifetime	⚠ ~4–5 years - Cover warranty standard period	✓ Up to 8–10 years - Improved	? Not yet proven
Endurance to low\partial SoC	⚠ Limited (sulfation)	✓ Excellent - No “memory effect” of any type	✓ Promising
Charge acceptance	⚠ Limited	✓ Very high @ > 0°C	? Uncertain
Fit with “always-on” vehicles (ICE)	⚠ Limited - High installed capacity - Sulfation risk	✗ High cost for energy - No possibility to recharge with engine not running	? Net yet proven
Fit with “always-on” vehicles (BEV)	⚠ Low endurance for cycling	✓ Really effective balancing - High recharge rate - No sort of “memory effect” - High cyclability	? Net yet proven

Characteristics	Lead acid	Li-ion	Na-ion
Safety concept - Performance	✓ Good	✗ High cost for “-30°C” power – Integration of uCAP?	✓ Promising cold performances
Safety Concept - Diagnosis	⚠ Limited External sensor - ASIL A - ASIL B (AGM only – Stimuli needed by vehicle)	✓ Good - ASIL B // ASIL C - Internal BMS mandatory	✓ Good - ASIL B // ASIL C - Internal BMS not mandatory
Component cost	✓ Low	✗ High	⚠ High but still to scale market
Vehicle integration cost (investissement)	✓ Low – State of art	✗ High	✗ High

Today **architectures** and **vehicles** are designed and **requirements fulfilled** with Lead Acid battery.

Principal driver for chancement:

- Requirements increase
- Regulation
- Cost

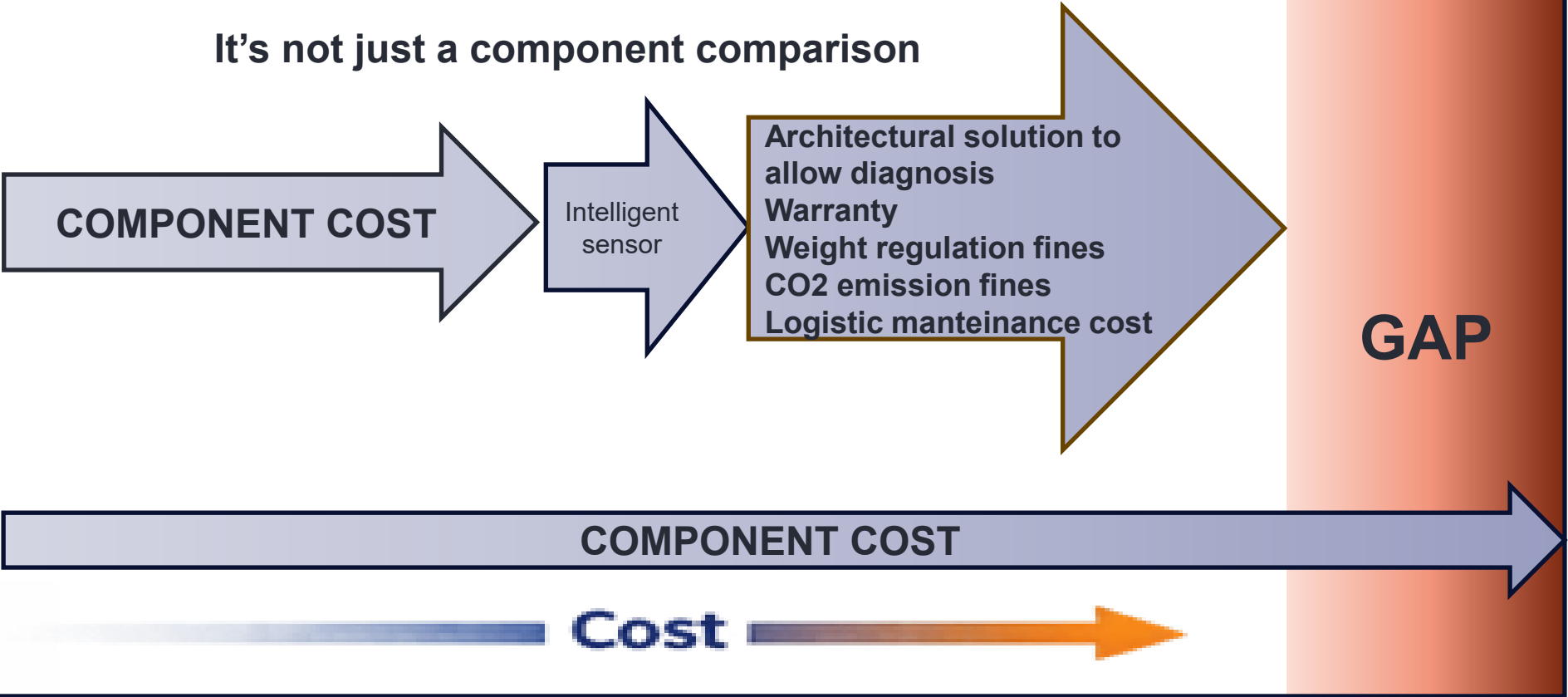


Battery technology	Cost (c€ / Wh)
Lead Acid	5 - 6
Lithium-ion	30 – 40*
Na-ion	30 – 40**

*Including BMS and Mosfet

**Including BMS
Rapidly evolving

It's not just a component comparison



TECHNOLOGICAL TREND



- Lead acid → Reference
- Li – ion → particular cases
 - Double battery system for propulsion acceptance (SEG A car)
 - Really strict packaging concern
- Na – ion → to be further investigated

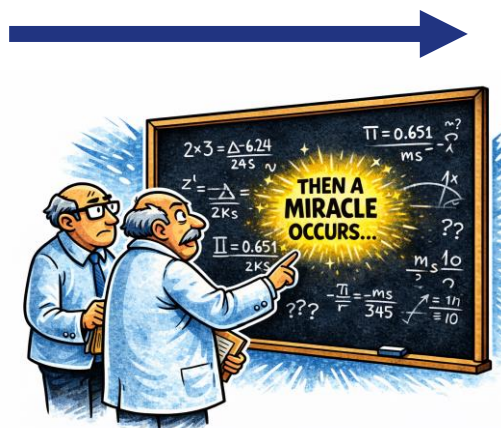
TREND on LEAD ACID BATTERY



Improved charge recovery



Improve monitoring or diagnosis ability



Mr. Mondoloni session
Wednesday – 9.30h

Don't miss:

Miss Viglione session
On Tuesday 14:39h

Flat Lead acid
Site under-seat
(140mm h)

