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EU battery demand and supply (2019-2030) in a global context

11 March, 2021

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OBJECTIVES AND SCOPE

EUROBAT commissioned Avicenne Energy with this study in order to:

- Obtain a good picture of **battery demand and production in Europe** today and in the future
- To understand to what extent the **EU battery industry will be able to cope with future demand**

🔗 Applications covered

🔗 Automotive

- 🔗 12V batteries: SLI and auxiliary
- 🔗 xEV batteries: mild hybrid, full Hybrid, plug-in HEVs and full EVs

🔗 Industrial

- 🔗 Stationary: UPS, telecom, and Energy Storage Systems
- 🔗 Motive (forklifts and others)

🔗 Technologies covered

- 🔗 Lead-based
- 🔗 Li-ion
- 🔗 Others: Nickel-based (NiCd, NiMH), Zinc Air, Na-ion

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The global battery market

- Automotive, industrial, stationary and motive power batteries

BATTERY MARKET DEMAND 2010-2030

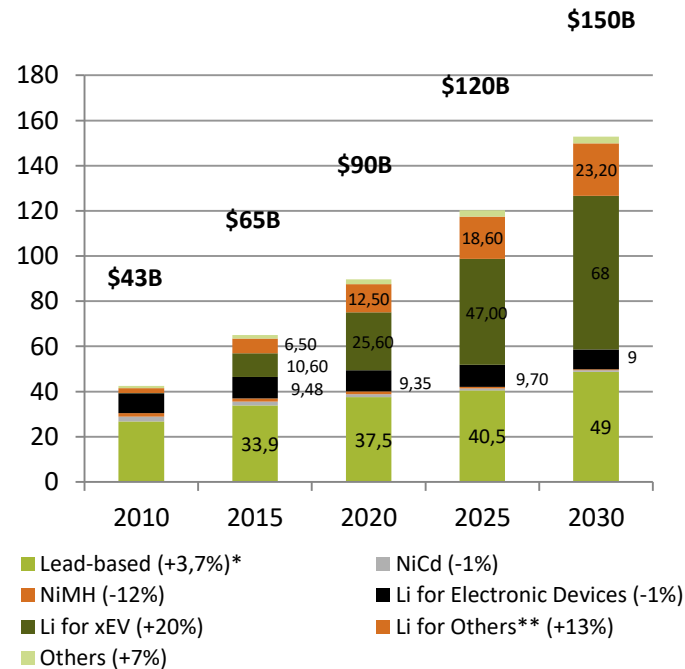
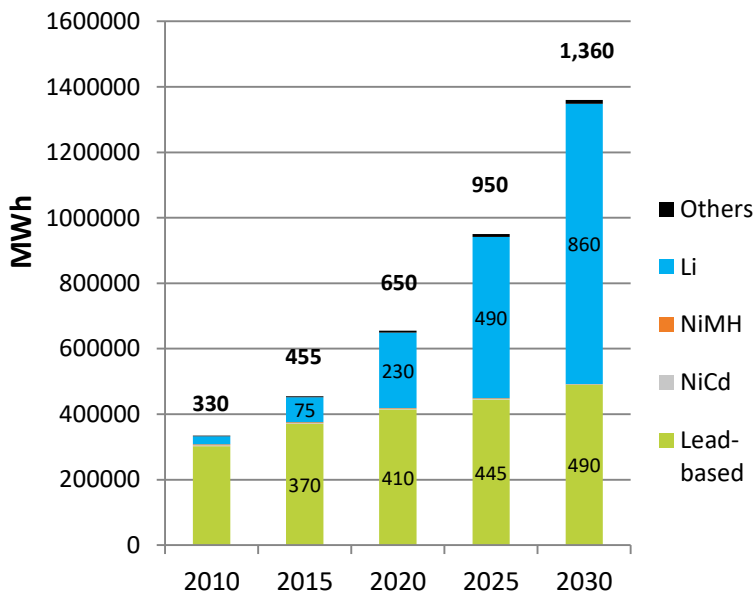
Lead-based and Li-ion batteries will remain the most important markets

Market value will reach \$150b in 2030

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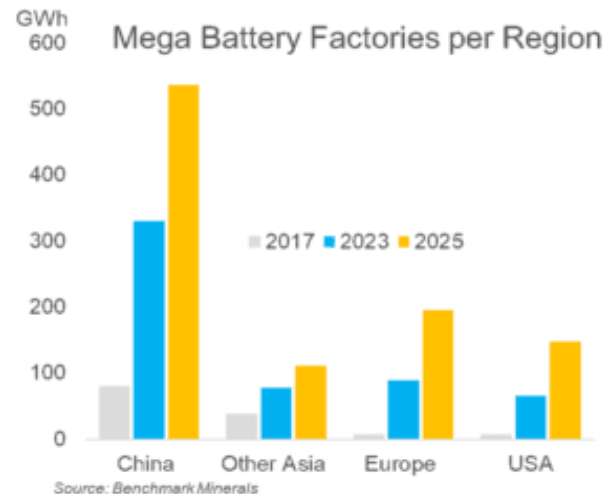
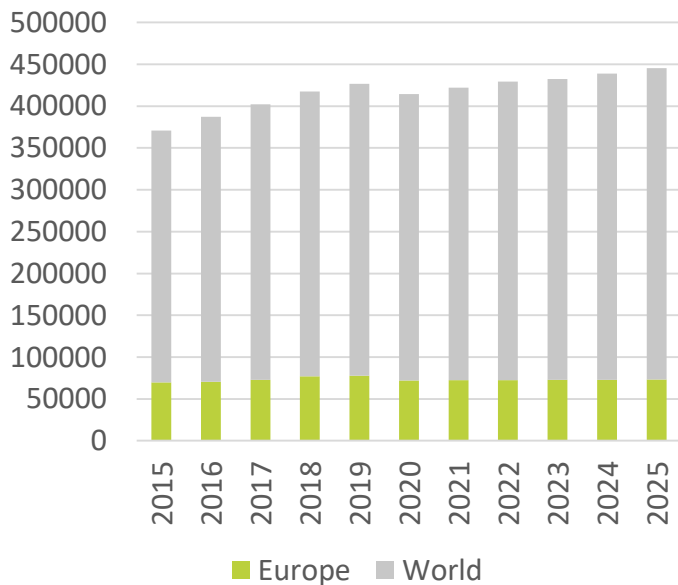
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EUROPE IN THE CONTEXT OF WORLDWIDE SUPPLY

Lead-based batteries: Europe accounts for ~20% of worldwide supply in MWh

Li-ion production in Europe will increase rapidly



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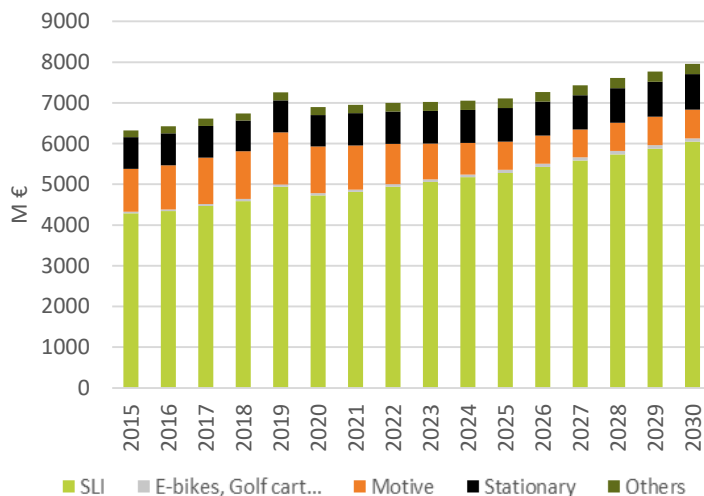
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EU battery supply and demand: 2015-2030

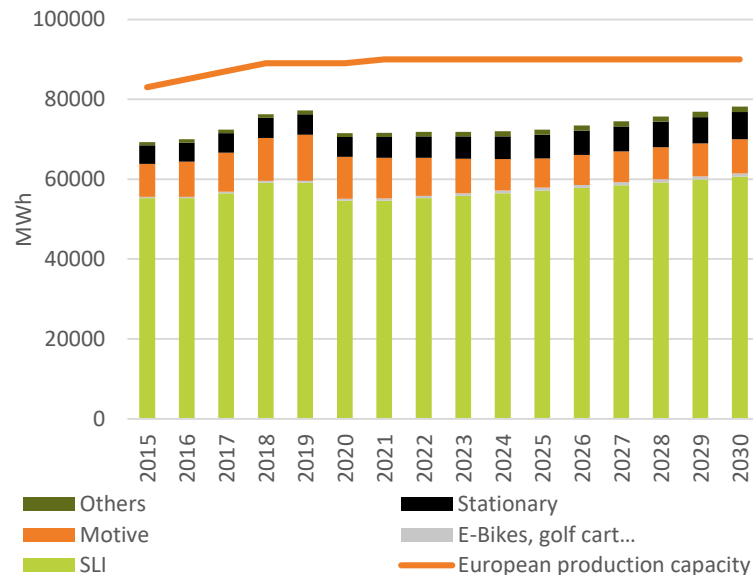
- Battery supply vs. demand by application and technology

KEY TAKE AWAYS (1): CHEMISTRIES

**Lead-based battery demand (M €)
in Europe (2015-2030)**



**Lead-based battery demand
(MWh) in Europe (2015-2030)**



EU battery demand and supply (2019-2030) in a global context

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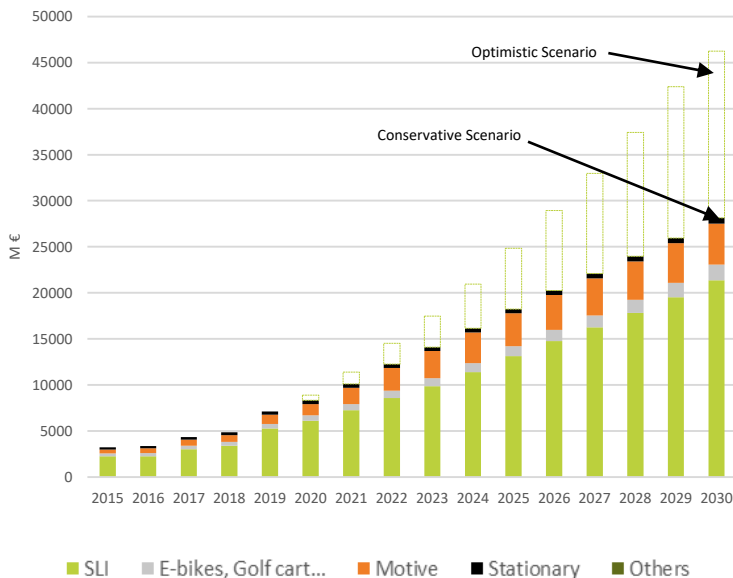
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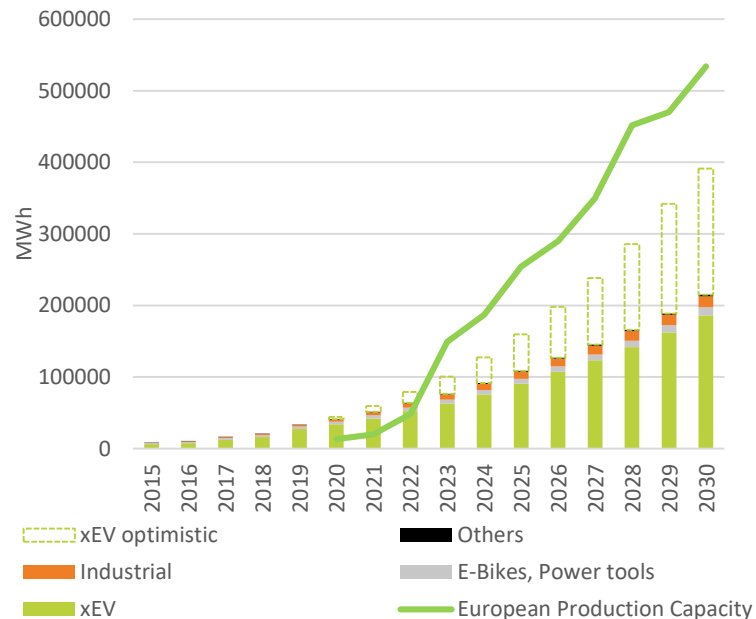
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KEY TAKE AWAYS (1): CHEMISTRIES

Lithium-based battery demand (M €)
in Europe (2015-2030)



Lithium-based battery demand (MWh)
in Europe (2015-2030)



EU battery demand and supply (2019-2030) in a global context

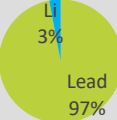
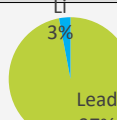



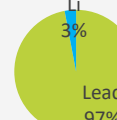

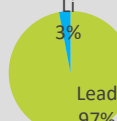

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KEY TAKEAWAYS(2): APPLICATIONS - AUTOMOTIVE BATTERIES

	12V Batteries	2030 in GWh	Traction Batteries
<u>Conventional ICE and micro-hybrids</u> (SLI and auxilliary batteries)			
<u>Mild Hybrid Vehicles</u> Strong growth expected: +48%			Chemistry is and will remain exclusively Li-ion 
<u>Full Hybrid Vehicles</u> Strong growth expected: +17%	Lead-based batteries will remain dominant with 12V Li-ion having only a very small market share (3%) by 2030.		Current mix of NiMH and Li-ion will move to 100% Li-ion by 2025-30 
<u>PHEV</u> Market share to grow slowly as a result of high cost.			Chemistry is and will remain exclusively Li-ion 
<u>EV</u> Strong growth anticipated (19-27%), but big difference in expected market share by 2030: conservative vs optimistic scenario			Chemistry is and will remain exclusively Li-ion 

EU battery demand and supply (2019-2030) in a global context

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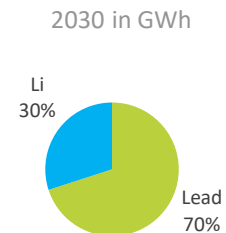
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KEY TAKEAWAYS (3): APPLICATIONS - INDUSTRIAL BATTERIES

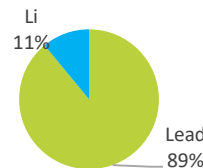
UPS (Uninterruptable Power Supply) Batteries

- **Lead-based batteries** will remain dominant in 2030 (70%)
- 5% annual growth to be expected up to 2030



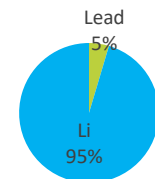
Telecom Batteries

- Almost exclusively **lead-based** today, but Li-ion market share of 11% expected by 2030
- Small annual growth (3%) expected up to 2030



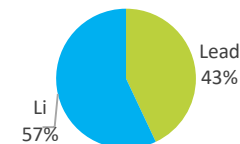
ESS (Energy Storage Systems)

- Today, **mostly Li-ion** batteries
- 10% annual growth expected up to 2030



Motive Batteries

- **Lead-based** batteries (90% market share) still dominant today
- By 2030, **Li-ion** will have majority share
- 4% annual growth anticipated up to 2030



Source: AVICENNE Energy 2020

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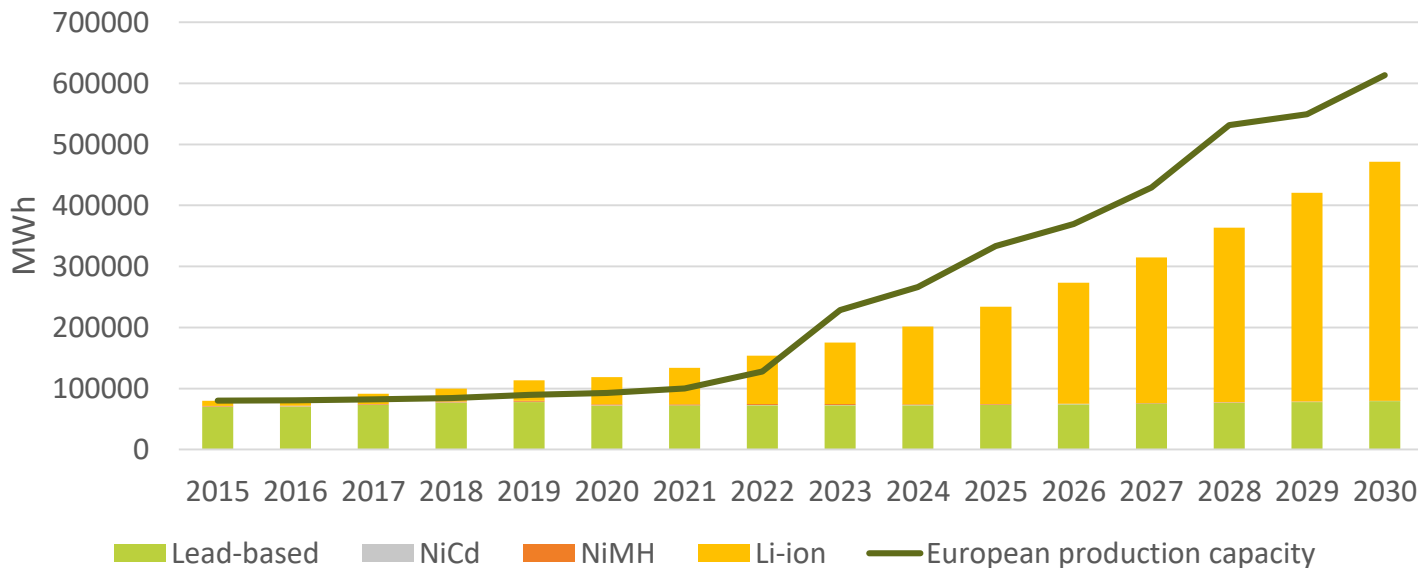
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EUROPEAN BATTERY PRODUCTION CAPACITY / DEMAND: OVERVIEW OF ALL TECHNOLOGIES COMBINED PER APPLICATION VS TOTAL DEMAND 2015-2030

European production capacity will be sufficient to meet demand



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KEY TAKEAWAYS – EUROPEAN BATTERY PRODUCTION

1. Total European Production (all chemistries)

- The European battery industry **produces all chemistries and will meet demand** thanks to **lead-based and Li-ion batteries**, comprising **more than 90%** of the total European battery market by 2030
- **NiCd and NiHM** chemistries to survive, but only serving **niche markets**.

2. Lead-based Batteries

- **Europe will retain its strong position in 2030** and **remain very competitive, but ongoing investment is needed** to maintain/improve production and for R&D
- Current/projected capacity will **just meet current/projected demand**
- **Key applications: 12V automotive, UPS (including back-up), telecom**

3. Li-ion batteries

- **Ten-fold future growth potential** and Europe is ready to meet demand, although currently heavily reliant on **imports**
- **E-Mobility is THE driver for growth**
- Key applications: **xEV with EV batteries** driving the technology (65% today, increasing to 85% by 2030)

OVERALL CONCLUSIONS

- Both **Li-ion and lead-based** batteries will be the two **mainstream** technologies by 2030, serving the different applications:
 - ✓ **Lead:** 12V automotive, UPS (including back-up), telecom
 - ✓ **Li-ion:** xEV, with EV batteries driving the technology (65% today, increasing to 85% by 2030)
 - ✓ Development of technology connected to specific applications: e.g. forklift, railways, ESS
- The EU **lead-based** battery industry **will maintain strong position** and will be able to meet projected growth but **ongoing investments in R&D and production** enhancement are required.
- The European **Li-ion** battery industry is **set to serve growing demand** as of 2023/2024.

Q&A



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THANK YOU