

Next-Generation EV Batteries: Innovation, Materials, and Supply Chain Resilience

Presenters:

Ann-Kathrin Lipponer, Systemic Innovation Team

TUESDAY, 10 March 2026 • 14:00 – 14:30 CET

SPEAKERS



Ann-Kathrin Lipponer
IRENA



Please make sure to **mute** yourself during the session to avoid background noise



If you have **Questions** to the speaker please use the **Q&A**



If you encounter any technical issues, please connect via **phone** or contact the **Help Desk**:
888.259.3826 or
<https://support.goto.com/webinar>

Critical materials sit at the intersection of innovation and geopolitics.

Council of the EU | Press release | 4 March 2026 10:55

Raw materials: Council adopts position to reinforce the security of supply and the circularity of EU industry

The Council has adopted its position on amending the Critical Raw Materials Act (CRMA). The amendments proposed by the Commission transfer responsibility for identifying large companies using critical raw materials (CRMs) to the European Commission. They also improve the management, transparency, and accountability of large companies in securing critical materials. Additionally, the proposal from the Commission empowers the measures large companies, facing potential supply disruption, to ensure uninterrupted production. Finally, the amendments propose to increase the recycling of permanent magnets.

The Council position supports the objectives of the proposal but requests the Commission to inform member states and the European critical raw materials companies of which companies have been identified as 'large companies' and their vulnerabilities. It also clarifies the Commission's authority to propose measures. Finally, the Council allows the use of digital product passports with information obligations about permanent magnets.



The updated critical raw materials list will strengthen Europe's security of supply, competitiveness, sustainable and resilient industry.

ALJAZEERA News Middle East Explained Opinion Sport Video More

BREAKING | Tehran says US wants to break Iran apart, seize its oil

News | Mining

Zimbabwe imposes ban on exports of all raw minerals and lithium concentrate

The immediate ban covers all raw minerals already in transit and will remain in place until further notice, the government says.

Listen to this article | 3 mins



Workers load lithium concentrate at Prospect Lithium Zimbabwe mine in Goromonzi [File: Philimon Bulawayo/Reuters]

By Al Jazeera Staff, AFP and Reuters

News Multimedia Spotlights

RELEASE
IMMEDIATE RELEASE

Dow Chemicals Invests \$11.8M for the Processing of Critical Materials

Feb. 20, 2026 | f x

Dow Chemicals announced today a January 30, 2026, investment of \$11.8 million to build a new processing facility for critical materials in the state of Michigan.

CATL

Home Solution R&D News Brands About Us Contact Us

Worldwide

CATL and CHANGAN Launch World's First Mass-Production Sodium-Ion Passenger Vehicle

2026-02-05

Yakeshi, Inner Mongolia | 5 February 2026 - CHANGAN Automobile, in partnership with CATL, today unveiled the world's first mass-production passenger vehicle equipped with sodium-ion batteries at the 'CHANGAN SDA Intelligence Milestone Release & Sodium-ion Battery Global Strategy Launch' event. The vehicle is set to reach the market by mid-2026.

As CHANGAN's exclusive sodium-ion battery strategic partner, CATL will supply its advanced Na3rx sodium-ion batteries across CHANGAN's full brand portfolio, including AVATR, Deepal, Qiyun, and UNI. The launch represents a major step in the industry's transition toward a dual-chemistry ecosystem, where sodium-ion and lithium-ion batteries complement each other to meet diverse customer needs.



BYD CATL SODIUM-ION BATTERY

CATL and BYD are betting on a new EV battery to overcome rising lithium

Peter Johnson | Jan 30 2026 - 7:47 am PT | 45 Comments



CATL and BYD are already dominating the EV battery market, accounting for over 50% of sales last year. With new tech rolling out in 2026, China's battery leaders look to stay ahead of the competition.

CATL and BYD double down on sodium-ion EV

pv magazine energy storage

News & Analysis About Us Advertise

Technologies Projects & Applications Markets Industry Products & Services

R&D Flow batteries Sodium-ion batteries

R&D

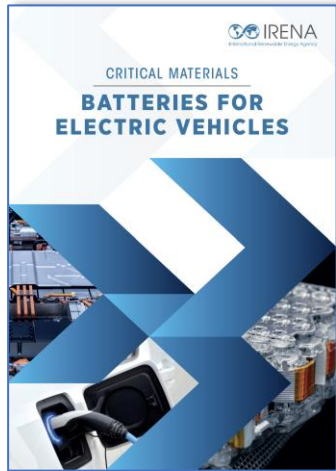
'It's not a matter of sodium versus lithium, we need both'

A US research team has developed all-solid-state sodium batteries that retain performance down to subzero temperatures. The systems utilize a special chloride-based solid-electrolyte-coated substrate.

By Emiliano Bellini | Nov 14, 2025

R&D Sodium-ion batteries Technologies

EV batteries are a major driver for critical material Demand – Innovation and circularity can help

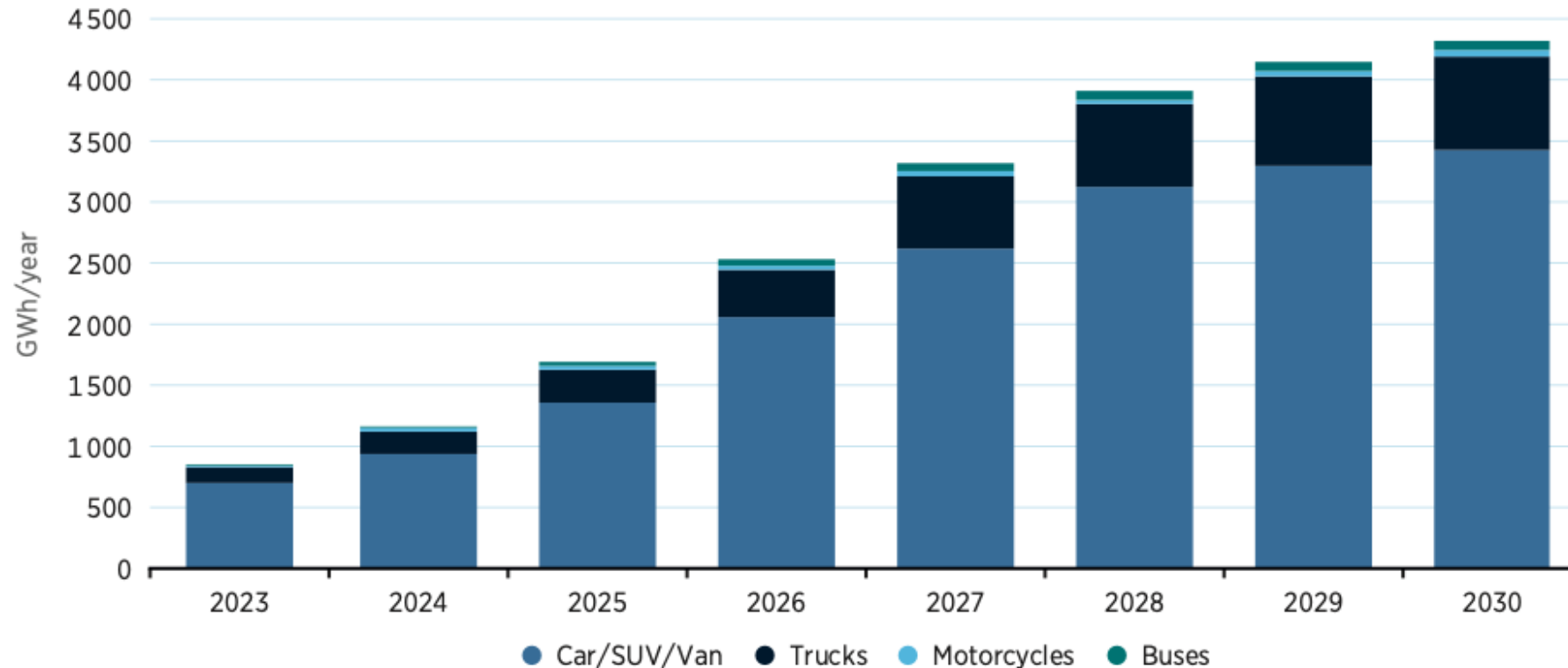


- Provides insights into **potential trajectories of critical material demand and supply towards 2030**, within the context of the rapidly evolving EV market.
- Explores **the role of innovative battery technologies in reducing or eliminating demand**.



- Provides an overview of the **battery technology landscape**
- Offers a deep dive into **sodium-ion batteries**, their construction, supply chain and outlook

EV battery production needs to grow five-fold by 2030, to stay in line with a 1.5C scenario



EV battery demand
In IRENA's 1.5°C
Scenario:

4,300 GWh per year
by **2030**.

Notes: Includes battery EVs and plug-in hybrid EVs. GWh = gigawatt hour; SUV = sports utility vehicle.

Staying aligned with **IRENA's 1.5°C Scenario** would require global EV sales to continue growing to about **60 million** passenger vehicles per year by 2030.

Long-term availability of materials is not a limitation for a full transition to EVs

| Material | Estimated annual demand in 2030 (Mt/year) | Percentage of demand from EVs in 2030 (%) | Estimated resources (Mt) | Ratio of resources to their annual demand in 2030 |
|-------------|---|---|--------------------------|---|
| Lithium | 2.5-3.1 | 78-85 | 560 | 180-225 |
| Cobalt | 0.24-0.39 | 32-57 | 25 ^a | 65-105 |
| Graphite | 6.5-7.4 | 28-33 | 800 | 1 110-1 200 |
| Nickel | 3.9-4.7 | 13-24 | 350 | 75-90 |
| Copper | 31.3-38.1 | 3.5-4.2 | 2 100 ^b | 55-70 |
| Phosphorous | 28.2-29.2 | 2.2-3.2 | 30 000 | 1 030-1 060 |
| Manganese | 22.5-26.0 | 1.3-2.6 | 17 000 | 660-760 |

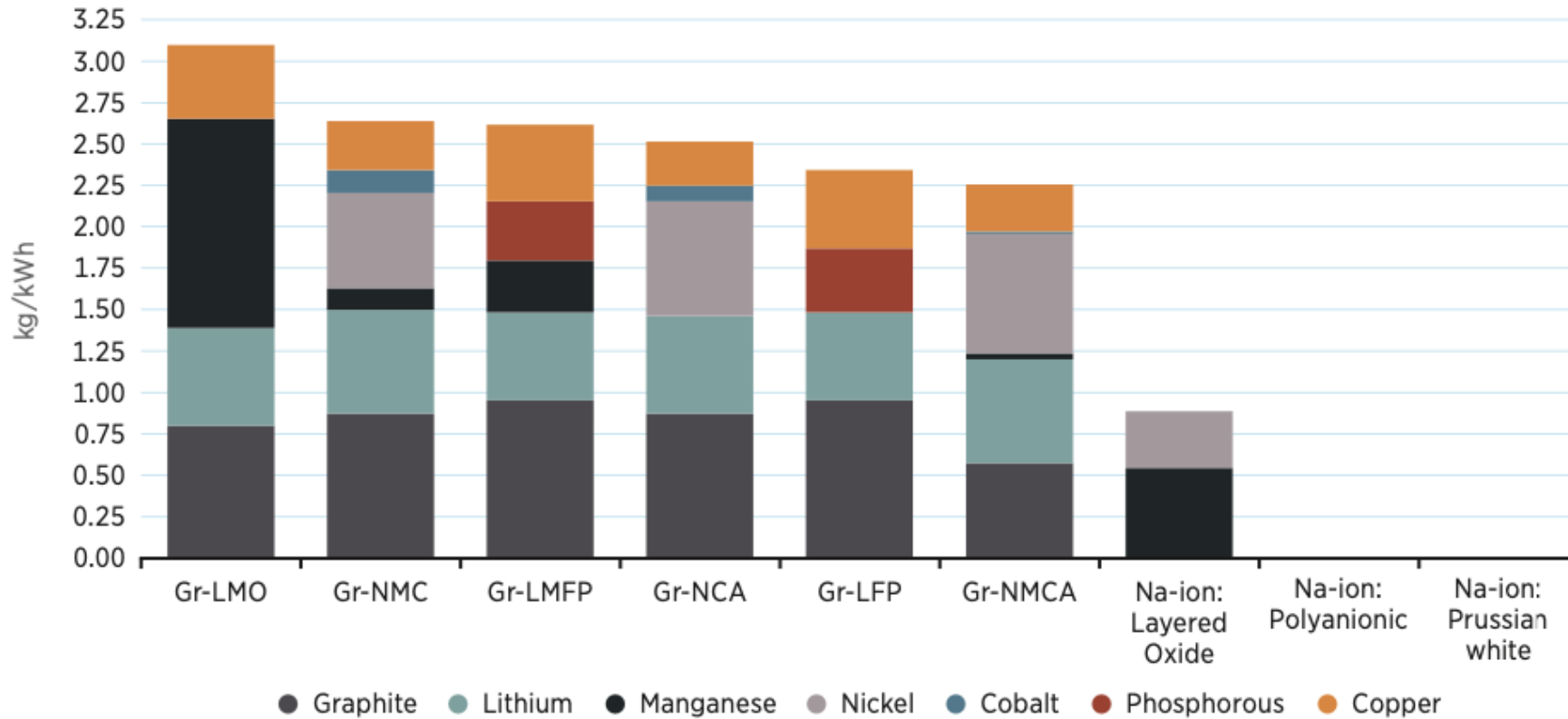
Based on: HalMan (2023) and USGS (2024).

Notes: a. In addition to the global terrestrial resources, more than 120 Mt of cobalt resources are found in deep-sea deposits.

b. Undiscovered copper resources amount to 3 500 Mt. EV = electric vehicle; Mt = million tonnes.

Material needs vary by battery type — and innovation helps reduce pressure on critical minerals

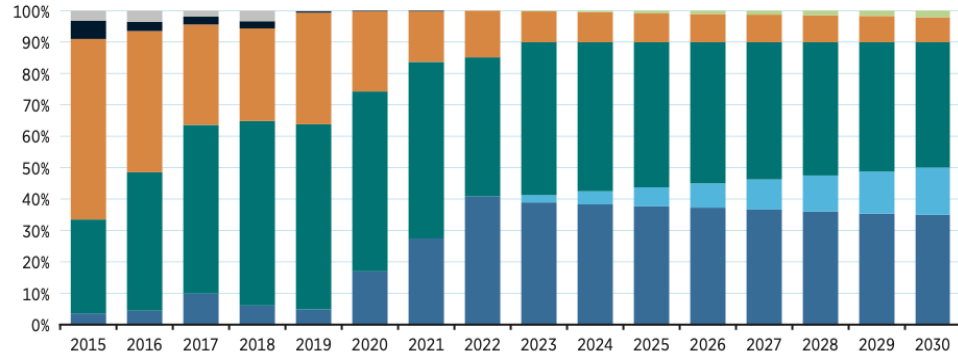
Estimated average critical material composition of selected EV battery packs



- Different EV batteries use different amounts of key materials.
- Some types, like LFP, avoid materials such as nickel and cobalt altogether.
- Newer options like sodium-ion can be made with very small amounts — or none — of today's most critical materials.

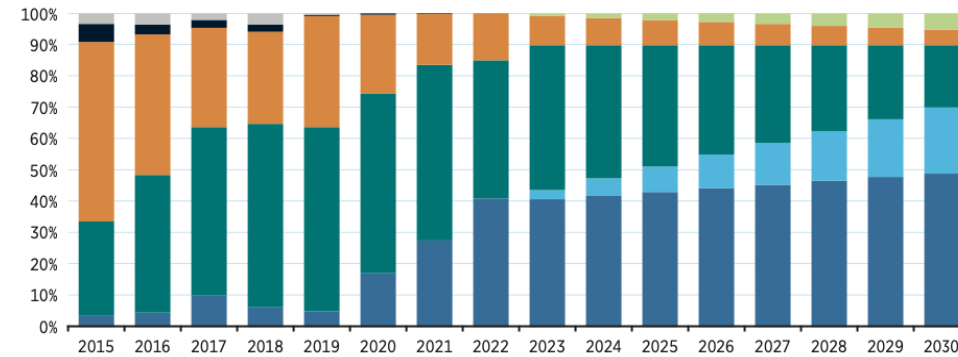
Based on: Argonne National Laboratory (2022, 2024), Bernstein (2021) and Maisel *et al.* (2023).

We explored three possible futures for battery chemistries in Evs.



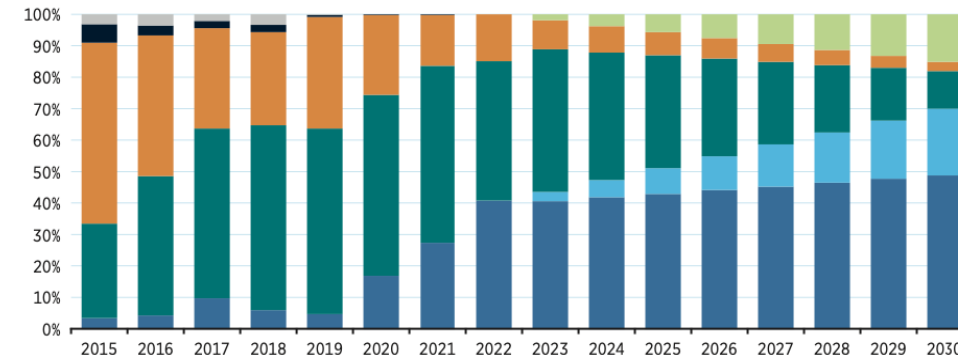
Technology Stagnation scenario:

Assumes limited innovation and a continued high share of nickel-rich chemistries.



Current Trends scenario:

Explores an increasing dominance of LFP and LMFP batteries



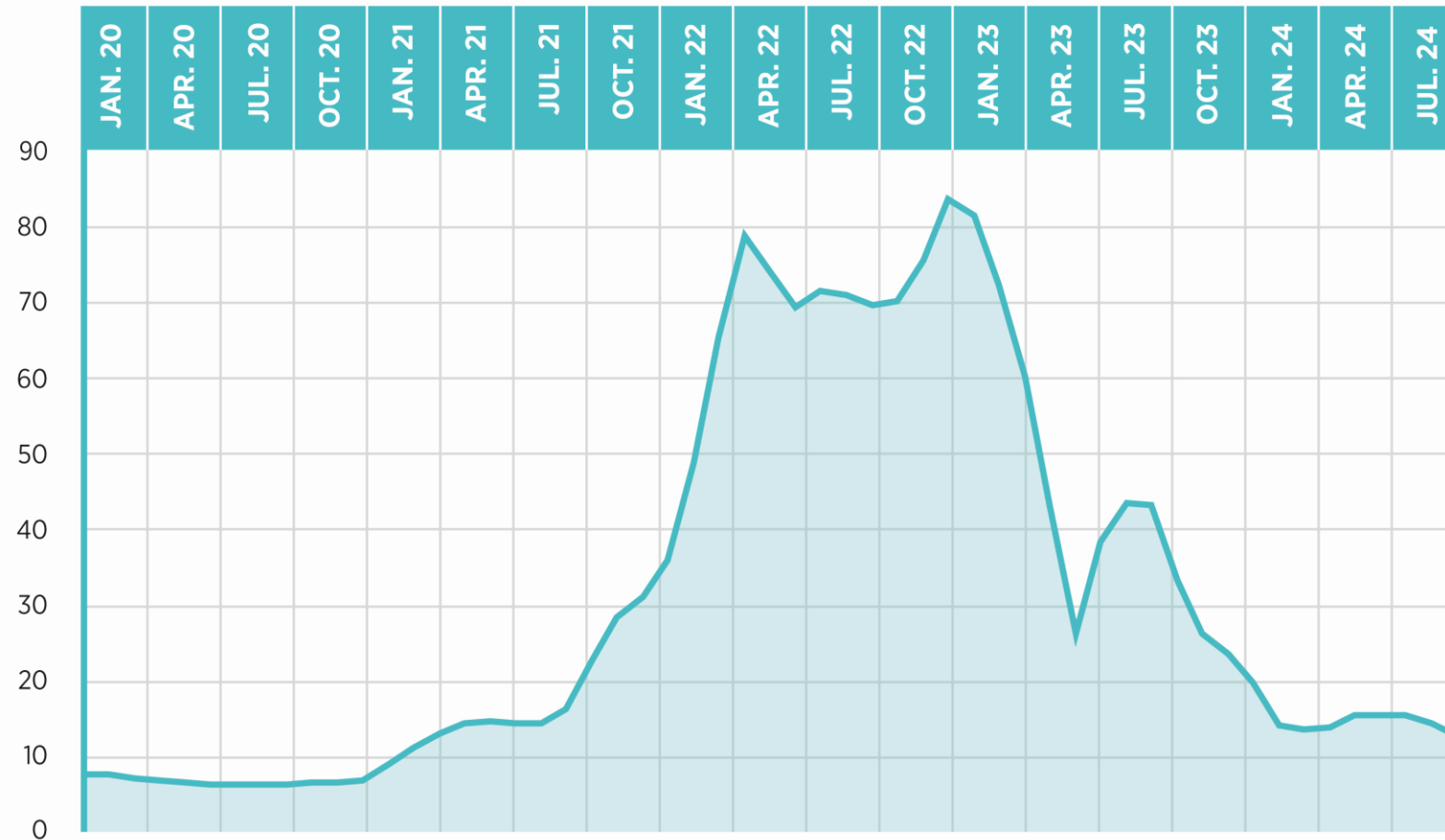
Increased Innovation scenario:

Assumes the prominence of LFP and LMFP alongside a significant increase in sodium-ion technology.

● LFP ● LMFP ● NMC ● NCA ● LMO ● Na-ion ● Other

Why sodium-ion batteries matter for the energy transition

Lithium carbonate prices, 2020–2024



Thousand
USD/tonne

How sodium-ion batteries work – schematic of a sodium-ion battery



Comparative performance of sodium-ion batteries across key metrics

| | Pb-acid | NiCd | NiMH | NaS | VRF | Li-Ion | SIB |
|--|-----------|-------------|-----------|--------------|---------------|--------------|-----------|
| Gravimetric energy density (Wh/kg) | 25-50 | 30-80 | 40-110 | 150-240 | 10-130 | 150-300* | 90-160 |
| Volumetric energy density (kWh/m³) | 70-135 | 15-150 | 40-300 | 150-350 | 10-33 | 200-700 | 250-375 |
| Lifetime (years) | 2-15 | 10-20 | 2-15 | 10-15 | 10-15 | 5-15 | 10-15 |
| Cycle life (no. of cycles) | 250-2 000 | 1 000-5 000 | 300-1 800 | 2 500-40 000 | 10 000-16 000 | 1 000-12 000 | 500-8 000 |
| Efficiency (%) | 63-90 | 60-90 | 50-80 | 75-90 | 75-85 | 85-95 | ≈92 |
| Working temperature (°C) | 18-45 | -40-50 | -30-70 | 300-350 | 5-45 | -20-60 | -40-80 |

Sodium-ion batteries are suitable for different applications

Stationary Storage

- SIB strengths: strong safety profile, good performance across wide temperatures, competitive lifespans.
- Lower energy density not such a constraint (weight/size less critical).
- Particularly suitable for extreme climates
- Hybrid SIB–LIB systems possible.

Electric Vehicles

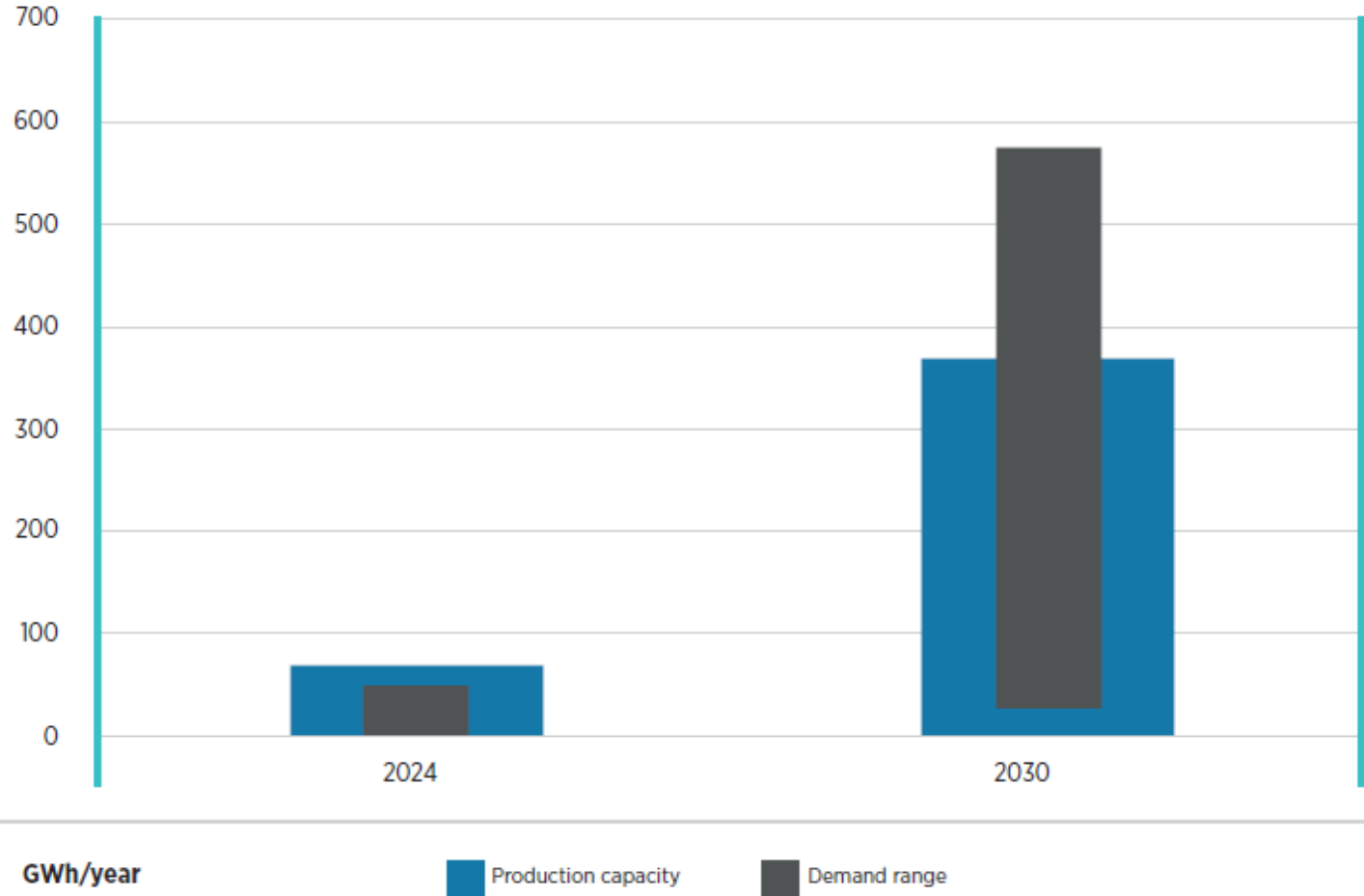
- Fast charging, wide operating temperature range, strong safety
- Typical range: ~250 km — ideal for urban mobility (daily average 5–19 km in Europe).
- First SIB-powered compact cars already on Chinese roads.
- Strong potential in two- and three-wheelers — key markets across Asia (China/India/SEA).
- Hybrid approaches emerging: sodium-LFP dual-power systems

Others

- Retrofitting: replace lead-acid batteries in conventional vehicles and light EVs
- Applications expanding to high-power cells for small devices, power tools.
- Industrial mobility: forklifts, airport ground equipment, etc.

Outlook for Sodium-ion Battery Deployment Toward 2030

Demand and production capacity forecasts for sodium-ion batteries





Accelerate innovation for reducing or eliminating the use of critical materials in EV batteries

- Accelerate innovation in EV battery technology with lower material requirements.
- Monitor markets closely and frequently and increase industry engagement to stay abreast of the latest innovation trends and breakthroughs.
- Accelerate the deployment of EV charging infrastructure to enable the adoption of smaller battery-sized EVs with lower material requirements.



Facilitate the rapid expansion of material mining and processing while adhering to the highest ESG standards

- Accelerate the development and expansion of mines by streamlining permitting processes.
- Support industry stakeholders to locate mining and processing activities in diverse geographies to make supply chains more resilient.
- Support the adoption of EV battery supply chains adhering to the principles of a sustainable, just and fair energy transition.
- Ensure the adequate supply of processed materials is not overlooked.



Strengthen international co-operation to leverage each country's strengths, acknowledging that no single country possesses all the materials and knowledge required

- Improve data transparency and availability in EV battery supply chains.
- Facilitate investment, knowledge sharing and capacity building to stimulate mining, processing and EV battery manufacturing in developing countries.



Maximise production from recyclable and scrap materials already in circulation and establish the groundwork for critical material recycling beyond 2030

- Increase secondary production and consumption by utilising stocks of recyclable and scrap materials already in circulation.
- Prepare the groundwork to manage the large-scale EV battery recycling expected beyond 2030.



Q & A
10 min

THANK YOU FOR JOINING US!

SEE YOU IN OUR NEXT WEBINARS

www.irena.org/events/2020/Jun/IRENA-Insights