Electric Vehicles Battery Re-use and Recycling Policies in China

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California-China Climate Institute

Mission
Aims to convert promising climate solutions into actual policies and outcomes across the pacific and advancing subnational climate leadership.

- **June 2017**, in Beijing, President Xi Jinping and Governor Jerry Brown agreed on the importance of climate change actions and building a platform to advance the cooperation between California and China on energy, climate and economic development;

- **June 2017**, in Beijing, Minister Xie Zhenhua, Governor Jerry Brown and Vice President of Tsinghua announced the intent to establish the U.S.-China Climate Institute;

- **Sep 2018**, University of California and Tsinghua University signed the Memorandum of Understanding to establish the California-China Climate Institute;

- **Jan 2019**, Governor Jerry Brown and Minister Xie exchanged ideas and confirmed serving as co-chairs to the institute;

- **Sep 2019**, California-China Climate Conference, launch of the Institute
• Overview of the electric vehicles (EV) battery industry in China
• Key battery re-use and recycling policies
• Summary
Overview of the electric vehicles (EV) battery industry in China
Battery re-use and recycling policies are crucial as we reach higher shares of ZEV sales

- For passenger vehicles, our study suggests 50% ZEV sales share for China and the US in 2030, and 100% in 2040.
- For freight transport, our study suggests 30% ZEV sales share in 2030, 70% in 2040, and 90%-100% in 2050-2060.
In the first half of 2021, NMC vehicle production declined to 57.5% while LFP share was 42.3%. The share of LFP used to be 38% in 2020, and lower than 33% in 2019.

Tesla just announced that all of its standard range models in China will use LFP batteries.

Reasons for the rise in LFP batteries: LFP batteries are cheaper and safer; consumer preference for shorter range vehicles; domestic manufacturers have been relying on LFP for a long time.
Two key battery re-use and recycling policies

• National Energy Administration’s tentative ban on EV battery re-use

• Ministry of Industry and Information Technology: New rule on the re-use of retired EV batteries
China’s tentative ban on using retired EV batteries in energy storage projects was lifted in the finalized policy.

Before the industry achieves a breakthrough in technologies managing battery uniformity in battery packs, and establishes comprehensive systems for battery monitoring and evaluation, in principle, no new large-scale echelon utilization of vehicle batteries in energy storage will be allowed.

Proposed policy: June 22

Finalized policy: September 29

It’s crucial to establish systematic management and tracking systems to control battery uniformity in battery packs. All reused batteries should pass safety evaluation checks by qualified organizations. New and existing energy storage projects with retired EV batteries need to be integrated into the online monitoring platform which provides real-time battery performance evaluation. Energy storage projects also need to be maintained and evaluated regularly and prepare emergency plans.
Change from a tentative ban to systematic regulatory approaches

Concerns in the draft policy
- managing battery uniformity in battery packs
- Real-time evaluation and monitoring
- No second-life use regulations for manufacturers when batteries are produced

Solutions in the finalized policy
- systematic management and tracking systems
- safety evaluation checks by qualified organizations
- Real-time online monitoring platform
- Regular maintenance
- Emergency planning

Benefits of re-using batteries in storage projects:
- Battery cost
- Grid stability
- Life-cycle emissions
- EV target
MIIT: Guiding battery re-use and recycling policy

- August 19, 2021
- Ministry of Industry and Information Technology and four other agencies
- Identifies requirements on companies that use retired EV batteries, batteries, and recycling companies
- Encourages cooperation between battery manufacturers and battery re-use companies
- Voluntary verification system of products that meet re-use requirements
- Identifies 26 re-use and recycling pilot companies
## Coordinating standards between China, US and the EU

<table>
<thead>
<tr>
<th>China</th>
<th>EU</th>
<th>US</th>
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<tbody>
<tr>
<td>Currently only <strong>regulations</strong>, but MIIT announced that legislation is in process</td>
<td><strong>New regulation</strong> concerning batteries and waste batteries, effective from Jan 2022</td>
<td><strong>Federal Level</strong></td>
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<td><strong>Safety</strong> is the highest priority</td>
<td><strong>Includes both sustainability and safety requirements</strong></td>
<td><strong>California</strong></td>
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<td><strong>Online tracking and monitoring systems</strong></td>
<td><strong>Battery management system</strong> storing data needed to determine the state of health of batteries</td>
<td>CalEPA Lithium-ion Car Battery Recycling Advisory Group</td>
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<td>Standards for manufacturers, batteries, re-use and recycling companies</td>
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<td>California Energy Commission pilot projects</td>
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<tr>
<td>Fewer numeric targets or requirements</td>
<td>Also includes mandatory minimum levels for recycled content, electrochemical performance and durability, due diligence obligations, recycling efficiencies, and labelling requirements</td>
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