


Review Article | [Published: 12 August 2017](#)

Generation and management of waste electric vehicle batteries in China

[Chengjian Xu](#), [Wenxuan Zhang](#), [Wenzhi He](#) ,
[Guangming Li](#), [Juwen Huang](#) & [Haochen Zhu](#)

[Environmental Science and Pollution Research](#)

24, 20825–20830 (2017)

3459 Accesses | **20** Citations | [Metrics](#)

Abstract

With the increasing adoption of EVs (electric vehicles), a large number of waste EV LIBs (electric vehicle lithium-ion batteries) were generated in China. Statistics showed generation of waste EV LIBs in 2016 reached approximately 10,000 tons, and the amount of them would be growing rapidly in the future. In view of the deleterious effects of waste EV LIBs on the environment and the valuable energy storage capacity or materials that can be reused in them, China has started emphasizing the management, reuse and recycling of them. This paper

Your Privacy

We use cookies to make sure that our website works properly, as well as some 'optional' cookies to personalise content and advertising, provide social media features and analyse how people use our site. By accepting some or all optional cookies you give consent to the processing of your personal data, including transfer to third parties, some in countries outside of the European Economic Area that do not offer the same data protection standards as the country where you live. You can decide which optional cookies to accept by clicking on 'Manage Settings', where you can also find more information about how your personal data is processed. Further information can be found in our [privacy policy](#).

**Accept all
cookies**

[Manage preferences](#)

EV LIBs and promote the sustainable development of EVs.

This is a preview of subscription content, [access via your institution](#).

Access options

Buy article PDF

39,95 €

Price includes VAT (Poland)

Instant access to the full article PDF.

[Rent this article via DeepDyve.](#)

[Learn more about Institutional subscriptions](#)

References

BRUNP RECYCLING (2016) Recycling for waste power batteries.

<http://www.brunp.com/en/about/i=39&comConte>

Your Privacy

We use cookies to make sure that our website works properly, as well as some 'optional' cookies to personalise content and advertising, provide social media features and analyse how people use our site. By accepting some or all optional cookies you give consent to the processing of your personal data, including transfer to third parties, some in countries outside of the European Economic Area that do not offer the same data protection standards as the country where you live. You can decide which optional cookies to accept by clicking on 'Manage Settings', where you can also find more information about how your personal data is processed. Further information can be found in our [privacy policy](#).

**Accept all
cookies**

[Manage preferences](#)

China battery (2014) Research and development of reuse technology of retired power batteries by National Power Grid Corp.

<http://www.itdcw.com/news/hyzx/0916310962014.html>. Accessed 21 Apr 2017

CPG (The Central People's Government of the People's Republic of China) (2006) Auto product recovery and usage technology policy.

http://www.gov.cn/jrzq/2006-02/14/content_191122.htm. Accessed 15 Apr 2017

CPG (The Central People's Government of the People's Republic of China) (2012) Energy-saving and new energy vehicle development plan (2012~2020).

http://www.gov.cn/zwqk/2012-07/09/content_2179032.htm. Accessed 16 Apr 2017

Dinger A, Martin R, Mosquet X, Rabl M, Rizoulis D, Russo M, Sticher G (2010) Batteries for electric cars: challenges, opportunities, and the outlook to 2020, vol 7:2017. The Boston Consulting Group, Boston

Your Privacy

We use cookies to make sure that our website works properly, as well as some 'optional' cookies to personalise content and advertising, provide social media features and analyse how people use our site. By accepting some or all optional cookies you give consent to the processing of your personal data, including transfer to third parties, some in countries outside of the European Economic Area that do not offer the same data protection standards as the country where you live. You can decide which optional cookies to accept by clicking on 'Manage Settings', where you can also find more information about how your personal data is processed. Further information can be found in our [privacy policy](#).

**Accept all
cookies**

[Manage preferences](#)

13 Apr 2017

Hou B (2015) Research on take-back modes of power battery for electric vehicle. Dissertation, Chongqing University of Technology (in Chinese)

Jiao N, Evans S (2016) Secondary use of electric vehicle batteries and potential impacts on business models. *J Ind Prod Eng* 33(5):348–354

Lang J, Cheng S, Zhou Y, Zhao B, Wang H, Zhang S (2013) Energy and environmental implications of hybrid and electric vehicles in China. *Energies* 6(5):2663–2685

Lu L, Han X, Li J, Hua J, Ouyang M (2013) A review on the key issues for lithium-ion battery management in electric vehicles. *J Power Sources* 226(3):272–288

Ma H, Balthasar F, Tait N, Riera-Palou X, Harrison A (2012) A new comparison between the life cycle greenhouse gas emissions of battery electric vehicles and internal combustion

Your Privacy

We use cookies to make sure that our website works properly, as well as some 'optional' cookies to personalise content and advertising, provide social media features and analyse how people use our site. By accepting some or all optional cookies you give consent to the processing of your personal data, including transfer to third parties, some in countries outside of the European Economic Area that do not offer the same data protection standards as the country where you live. You can decide which optional cookies to accept by clicking on 'Manage Settings', where you can also find more information about how your personal data is processed. Further information can be found in our [privacy policy](#).

**Accept all
cookies**

[Manage preferences](#)

MIIT (Ministry of Industry and Information Technology of the People's Republic of China) (2016) Interim measures for the administration of recovery and utilization of power batteries for new energy vehicles (draft for comment).

<http://www.miit.gov.cn/n1146295/n1652858/n1653100/n3767755/c5392434/content.html>.

Accessed 19 Apr 2017

NDRC (National Development and Reform Commission) (2016) Technology policy for the recycling of power battery (2015 Edition).

http://www.sdpc.gov.cn/zcfb/zcfbgg/201601/t20160128_773250.html. Accessed 17 Apr 2017

Richa K, Babbitt CW, Gaustad G, Wang X (2014) A future perspective on lithium-ion battery waste flows from electric vehicles. *Resour Conserv Recycl* 83:63–76

Richardson DB (2013) Electric vehicles and the electric grid: a review of modeling approaches, impacts, and renewable energy integration. *Renew Sust Energ Rev* 19(19):247–254

Shin SM, Kim NH, Sohn JS, Yang DH, Kim YH

Your Privacy

We use cookies to make sure that our website works properly, as well as some 'optional' cookies to personalise content and advertising, provide social media features and analyse how people use our site. By accepting some or all optional cookies you give consent to the processing of your personal data, including transfer to third parties, some in countries outside of the European Economic Area that do not offer the same data protection standards as the country where you live. You can decide which optional cookies to accept by clicking on 'Manage Settings', where you can also find more information about how your personal data is processed. Further information can be found in our [privacy policy](#).

**Accept all
cookies**

[Manage preferences](#)

Williams B, Lipman T (2010) Strategy for overcoming cost hurdles of plug-in-hybrid battery in California: integrating post-vehicle secondary use values. *Transp Res Rec* 2191:59–66

Zeng X, Li J, Ren Y (2012) Prediction of various discarded lithium batteries in China, sustainable systems and technology (ISSST). 2012 I.E. international symposium on IEEE, pp. 1–4

Acknowledgements

This work was supported by the National Natural Science Foundation of China (grant number 51078286).

Author information

Authors and Affiliations

State Key Laboratory of Pollution Control and Resource Reuse, School of Environmental Science and Engineering,

Your Privacy

We use cookies to make sure that our website works properly, as well as some ‘optional’ cookies to personalise content and advertising, provide social media features and analyse how people use our site. By accepting some or all optional cookies you give consent to the processing of your personal data, including transfer to third parties, some in countries outside of the European Economic Area that do not offer the same data protection standards as the country where you live. You can decide which optional cookies to accept by clicking on ‘Manage Settings’, where you can also find more information about how your personal data is processed. Further information can be found in our [privacy policy](#).

**Accept all
cookies**

[Manage preferences](#)

Rights and permissions

[Reprints and Permissions](#)

About this article

Cite this article

Xu, C., Zhang, W., He, W. *et al.* Generation and management of waste electric vehicle batteries in China. *Environ Sci Pollut Res* **24**, 20825–20830 (2017).
<https://doi.org/10.1007/s11356-017-9890-8>

Received	Accepted	Published
05 June 2017	01 August 2017	12 August 2017

Issue Date
September 2017

DOI
<https://doi.org/10.1007/s11356-017-9890-8>

Keywords

Waste electric vehicle batteries **Generation**
Management **Reuse** **Recycling** **China**

Your Privacy

We use cookies to make sure that our website works properly, as well as some ‘optional’ cookies to personalise content and advertising, provide social media features and analyse how people use our site. By accepting some or all optional cookies you give consent to the processing of your personal data, including transfer to third parties, some in countries outside of the European Economic Area that do not offer the same data protection standards as the country where you live. You can decide which optional cookies to accept by clicking on ‘Manage Settings’, where you can also find more information about how your personal data is processed. Further information can be found in our [privacy policy](#).

**Accept all
cookies**

[Manage preferences](#)

Your Privacy

We use cookies to make sure that our website works properly, as well as some 'optional' cookies to personalise content and advertising, provide social media features and analyse how people use our site. By accepting some or all optional cookies you give consent to the processing of your personal data, including transfer to third parties, some in countries outside of the European Economic Area that do not offer the same data protection standards as the country where you live. You can decide which optional cookies to accept by clicking on 'Manage Settings', where you can also find more information about how your personal data is processed. Further information can be found in our [privacy_policy](#).

**Accept all
cookies**

[Manage preferences](#)