

National Battery Strategy Submission

Greenpeace Australia Pacific

March 2023

GREENPEACE

About Greenpeace

Greenpeace is a global environmental network dedicated to the mission of securing a world capable of nurturing life in all of its magnificent diversity. We are fully independent, accepting no funding from any government, business or political party anywhere in the world.

Greenpeace Australia Pacific is an autonomous entity headquartered in Sydney. More than 1.2 million people participate within the Greenpeace Australia Pacific network across all platforms, showing their support for ambitious climate action. Greenpeace considers the current trajectory of global warming to be the single greatest threat to human health, security, and well-being, as well as to global biodiversity. For these reasons we urge the Federal Government to take the strongest possible action on climate change, in line with credible pathways to limiting global heating to 1.5 degrees.

We thank the Federal Government and the Department of Industry, Sciences and Resources for the opportunity to input into this important strategy.

Summary and Recommendations

The use of energy by households and businesses is the largest source of Australia's greenhouse gas emissions. Australia, and the world, must rapidly reduce emissions from energy consumption to ensure a safe climate future. As Australia increases its reliance on renewable energy, and electrified machines, demand for batteries will increase.

The electrification of everything is a net good: if managed carefully it will reduce our overall greenhouse gas emissions, reduce other kinds of harmful pollution and increase the uptake of clean technologies like rooftop solar. However the battery manufacturing process contains inherent risks which must be managed to avoid environmental and human harm. The rare-earth minerals used in the construction of batteries have been tied to serious environmental harms as well as labour and community rights violations.

The solution for Australia is to focus on minimising those harms as much as possible. Greenpeace recommends a three-part approach to managing the externalities involved in a scale-up of battery production and use.

1. **Regulate:** Government regulated, transparent and verified supply chains for domestically produced and internationally sourced batteries, with clear rules for which products are unacceptable due to ethical and/or environmental factors.
2. **Reduce:** Support (through public investment) research and development and commercialisation of new kinds of batteries which rely on abundantly available resources, or which significantly reduce mineral inputs.
3. **Reuse:** Incentive the recycling of batteries through rebates, penalties and regulations to achieve resource recovery rates of: 95 % for cobalt, 95% for copper, 95% for lead, 95% for nickel, and 70% for lithium by 2030.

Regulate

Environmental Impact of Battery Production

In both Australia and throughout the Americas, the expansion of water-intensive lithium mining has placed considerable economic and agricultural pressure on Indigenous groups and local communities.¹ More than half of the global supply of cobalt, an essential mineral used in batteries, comes from the Democratic Republic of Congo. Historically, much of the mining for its

¹ AidWatch (2021), 'Case Study: Indigenous Land Rights & The Lithium Rush.' *AidWatch*, <https://aidwatch.org.au/case-studies/indigenous-land-rights-the-lithium-rush/>

extraction has been linked with human rights abuses,² as well as environmental damage and serious health repercussions for those mining it.^{3, 4, 5}

Efforts to Regulate and Track Battery Inputs

Currently, the Organisation for Economic Cooperation and Development (OECD) has guidelines for due diligence in supply chains of minerals.⁶ These are, however, focused on recommendations surrounding mineral purchasing in conflict-affected and high risk areas. Extending these guidelines to include child labour and corruption (such as the bribery seen in Indonesian and Brazilian mining) would further bolster the ethical constraints for sourcing lithium, a key part of current battery manufacturing.

Supply chain mapping can aid transparency and accountability. OECD guidelines emphasise that simply because a company does not interact with Artisanal and Small-Scale (ASM) operations, they should not be able to label their supply chains clean, sustainable or responsible. This is because of the amount of interaction between traditional and ASM miners, as well as the high levels of corruption within the industry.⁷ With this in mind, pushing for accountability through the mandatory publication of supply chain information is recommended as a long term policy mechanism in Australia or throughout the OECD.

The private sector is already experimenting with a similar approach: car manufacturer Polestar has started using blockchain technology to ensure traceability of key battery minerals such as cobalt and mica.⁸ The London Metal Exchange now only accepts and trades with producers

² Ochab, E. U (Jan 13, 2020), 'Are These Tech Companies Complicit In Human Rights Abuses Of Child Cobalt Miners In Congo?' *Forbes*, <https://www.forbes.com/sites/ewelinaochab/2020/01/13/are-these-tech-companies-complicit-in-human-rights-abuses-of-child-cobalt-miners-in-congo/?sh=efc50933b178>

³ Lattanzio, R. K. & Clark, C. E. (June 16, 2020), Environmental Effects of Battery Electric and Internal Combustion Engine Vehicles.' *Congressional Research Service*, (p.8), <https://sgp.fas.org/crs/misc/R46420.pdf>

⁴ CDC (June 24, 2019), 'The National Institute for Occupational Safety and Health - Cobalt.' *The Centre for Disease Control and Prevention*, <https://www.cdc.gov/niosh/topics/cobalt/default.html>

⁵ Nemery, B (2007), 'Hard Metal Lung Disease: Still Hard to Understand.' *American Journal of Respiratory and Critical Care Medicine*, <https://www.atsjournals.org/doi/full/10.1164/rccm.200704-527ED>

⁶ OECD (n.d), 'OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas.' *Organisation for Economic Co-operation and Development*, <https://www.oecd.org/corporate/mne/mining.htm>

⁷ OECD (2019), 'Interconnected supply chains: a comprehensive look at due diligence challenges and opportunities sourcing cobalt and copper from the Democratic Republic of the Congo - 3.3 - Corruption, money laundering, tax evasion and fraudulent misrepresentation of origin of minerals.' *Organisation for Economic Co-operation and Development*, (p.44) <https://mneguidelines.oecd.org/Interconnected-supply-chains-a-comprehensive-look-at-due-diligence-challenges-and-opportunities-sourcing-cobalt-and-copper-from-the-DRC.pdf>

⁸ Australian Financial Review. "Australian firms lag in net-zero supply chain: Polestar." Accessed January 10, 2023. <https://www.afr.com/companies/transport/australian-firms-lag-in-net-zero-supply-chain-polestar-20230110->

who can prove transparency in their sourcing process. Non-government industry initiatives like this are critical in aiding international transparency, and provide a starting point for Governments like Australia to take the next step.⁹

Australia has an opportunity to lead the world through introducing strong regulations which allow full transparency related to the global supply chain for batteries. It may also present a market opportunity: the ability to prove to potential buyers of Australian batteries that the national production process, and all associated inputs, are 100% ethically and environmentally sound.

Greenpeace Australia Pacific supports legislation introduced in Australia similar to the European Union's Ecodesign for Sustainable Products Regulation Proposal. Legislation like this will require industry and business to provide verification for their environmental claims and the source of their batteries.

Reduce

The market does not always price-in the environmental or human impacts of resource extraction - therefore it is important for the Australian Government to subsidise the development of low-mineral use batteries and incentive batteries which use the minimum viable amount of critical minerals. A study by Transport and Environment (T&E), an NGO, found that technological advancements will halve the amount of lithium required to produce an electric vehicle (EV) battery over the next decade. It also projected that cobalt usage would drop by three quarters, and nickel by around one fifth.¹⁰ These advancements, along with new technology batteries, will mean an overall reduction in mineral requirements for batteries over time. However it is important the Australian Government proactively encourages the development of low-resource use batteries to ensure they reach the mainstream market.

New Battery Technologies

Regarding nascent and ground-breaking innovations, the battery sector is constantly maturing with many new types of more sustainable, longer lasting, better performing, and safer options nearing commercialisation. Aluminium-based batteries such as one designed by the

[p5cbht#:~:text=The%20company's%20Polestar%20%20car.as%20mica%2C%20nickel%20and%20lithium.](#)

⁹ LME (October, 2019), 'Overview of LME responsible sourcing - 3. Features Underpinning the LME requirements.' *The London Metals Exchange*, (p.5)

<https://www.lme.com/-/media/Files/Company/Responsibility/Responsible-sourcing/Overview-of-LME-responsible-sourcing-2.pdf>

¹⁰ Lambert, F (March 1, 2021), 'Mining for electric car batteries 'hundreds of times' better than petrol car emissions cycles.' *Electrek*,

<https://electrek.co/2021/03/01/mining-electric-car-batteries-hundreds-of-times-better-than-petrol-car-emission-cycles/#:~:text=in%20most%20markets.-.Now.-the%20oil%20industry>

Massachusetts Institute of Technology (MIT) utilise little else than aluminium, sulphur, and sodium - all of which are widely abundant low-cost materials. This battery is many magnitudes safer due to not having a flammable electrolyte (like lithium-ion units do), and also promises to be longer lasting and better performing.¹¹ In Australia - Brisbane based Graphene Manufacturing Group (GMG) has developed a graphene-aluminium-ion battery that is said to charge 70 times faster than a lithium-ion battery as well as being safer, and having three times the lifespan.¹²

Reuse

The International Energy Agency (IEA) predicts that the world is currently on track to double its overall mineral requirements for clean-energy technologies by 2040. As such, recycled materials must play a larger role in the manufacturing of new appliances, renewable energy solutions, and EVs.¹³ Up to 97% of a lithium-ion battery's materials can be recycled, and many initiatives are being implemented to drive down the industries' reliance on raw lithium.¹⁴ In Australia, only 2-10% of lithium-ion batteries are recycled - this means there is a market-gap with huge economic, ethical, and environmental opportunities that car manufactures and governments could seize with the right investments in processing infrastructure.¹⁵ Recycled materials could, in theory, supply over half of the lithium, cobalt and nickel needed for new batteries by 2040 - even with a growth in EV uptake.¹⁶

Low-side projections estimate that by 2040 recycled lithium, cobalt, and nickel could supply 10% of new battery needs,¹⁷ while other projections estimate this number at closer to 50%.¹⁸ It is further predicted that a spike in domestic recycling needs will occur in 2027 for Australia, as the

¹¹ Chandler, D. L (Aug. 24, 2022), 'A new concept for low-cost batteries.' *MIT News via Massachusetts Institute of Technology*, <https://news.mit.edu/2022/aluminum-sulfur-battery-0824>

¹² Ludlow, M (Aug. 10, 2022), 'The battery that charges 70 times faster than lithium-ion.' *The Australian Financial Review*, <https://www.afr.com/companies/energy/the-battery-that-charges-70-times-faster-than-lithium-ion-20220808-p5b84s>

¹³ IEA (May, 2021), 'The Role of Critical Minerals in Clean Energy Transitions - Executive Summary.' *The International Energy Agency*, <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary>

¹⁴ Hagon, T (Nov, 2021), 'Recycling old electric car batteries.' *Royal Automotive Club of WA*, <https://rac.com.au/car-motoring/info/ev-battery-recycling>

¹⁵ Hagon, T (Nov, 2021), 'Recycling old electric car batteries.' *Royal Automotive Club of WA*, <https://rac.com.au/car-motoring/info/ev-battery-recycling>

¹⁶ Dunn, Jessica, Margaret Slattery, Alissa Kendall, Hanjiro Ambrose, and Shuhan Shen. "Circularity of Lithium-Ion Battery Materials in Electric Vehicles." *Environmental Science & Technology* 55, no. 8 (2021): 5189-5198.

¹⁷ IEA (May, 2021), 'The Role of Critical Minerals in Clean Energy Transitions - Executive Summary.' *The International Energy Agency*, <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary>

¹⁸ Dunn, J et al (March 25, 2021), 'Circularity of Lithium-Ion Battery Materials in Electric Vehicles.' *Environment Science and Technology via ACS Publications*, <https://pubs.acs.org/doi/abs/10.1021/acs.est.0c07030>

batteries have a lifespan of roughly 8 years and EV uptake spiked in 2019.¹⁹ These figures outline a key market opportunity waiting to be commercialised.

Some manufacturers are leading the way with end-of-life (EoL) initiatives for their vehicles with Both Renault and BMW having implemented EoL plans for their EV batteries.^{20,21} Tesla has also claimed to recycle 100% of their used lithium-ion batteries with an in-house recycling system said to reuse over 90% of the raw materials.²² There are further examples of battery re-purposing, for example deployment to a stationary energy battery.

At present, in Australia there is only one government-funded scheme for EV battery recycling that is in its early stages of development in Victoria.²³ On a federal level in Australia, more should be done to adopt initiatives similar to the European Union's Circular Economy Action Plan (CEAP).²⁴ The CEAP requires that manufacturers who sell to the EU market are responsible for EoL recycling and handling, regardless of ownership; and further, that all batteries that enter the EU market must be "sustainable, circular and safe".²⁵

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¹⁹ EVC (August, 2021), 'State of Electric Vehicles.' *Electric Vehicle Council*, (p.6)
<https://electricvehiclecouncil.com.au/reports/state-of-electric-vehicles-2021/>

²⁰ Trinkwon, W (March 18, 2021), 'Renault joins project to develop EV battery recycling loop.' *Autocar*,
<https://www.autocar.co.uk/car-news/industry-news-tech%2C-development-and-manufacturing/renault-joins-project-develop-ev-battery>

²¹ Electrive (May 25, 2022), 'BMW to establish closed recycling loop for batteries.' *Electrive*,
<https://www.electrive.com/2022/05/25/bmw-to-establish-closed-recycling-loop-for-batteries/>

²² Crider, J (May 8, 2022), 'Tesla's Recycled Batteries: Almost 92% Reuse Of Raw Materials.' *CleanTechnica*,

<https://cleantechnica.com/2022/05/08/teslas-recycled-batteries-almost-92-reuse-of-raw-materials/>

²³ Circular Economy Business Innovation Centre (May 4, 2022), "Funded project - A sustainable business model for retired electric vehicle batteries." *Circular Economy Business Innovation Centre*,
<https://www.cebic.vic.gov.au/projects/electric-vehicle-battery-recycling>

²⁴ Stuart, G et al (April 5, 2021), 'Europe: EU Commission proposes new regulation for sustainable batteries.' *Global Compliance News*,
<https://www.globalcompliancenes.com/2021/04/05/all-europeeu-commission-proposes-new-regulation-for-sustainable-batteries110321/>

²⁵ Stuart, G et al (April 5, 2021), 'Europe: EU Commission proposes new regulation for sustainable batteries.' *Global Compliance News*,
<https://www.globalcompliancenes.com/2021/04/05/all-europeeu-commission-proposes-new-regulation-for-sustainable-batteries110321/>