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A Proposal for a Decarbonization Tax Discount to Increase Australian Lithium Production to Meet Electric Vehicles and Net Zero Global Targets

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Abstract

Current commitments with net zero 2050 require that more than two billion electric vehicles (EVs) be produced globally by 2035. Australia produces more than 55% of the global lithium in the world. We argue that Australia's most significant contribution to realizing net zero 2050 could be to increase lithium production 10-20-fold by 2035. A similar case could equally be made for increasing other critical minerals. This would also contribute to securing Australia's energy and national security. To realize these benefits current investment in lithium is much lower than the production of lithium batteries used in EVs requires, reflecting suboptimal tax rates. We conclude by proposing that a decarbonization tax discount for critical minerals is needed.

Keywords: Electric Vehicles, Lithium, Net Zero 2050, Effective Taxation Rate

JEL classification: E20, E60, Q20, Q28

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1. Introduction

According to the International Energy Association (IEA) (2022): "Few areas in the world of clean energy are as dynamic as the electric car market. Sales of electric vehicles (EVs) doubled in 2021 from the previous year to a new record of 6.6 million….Public spending on subsidies and incentives for EVs nearly doubled in 2021 to nearly USD 30 billion". In Figure 1 we plot EV production consistent with Net Zero 2050. Current commitments with net zero 2050 require more than two billion electric vehicles (EVs) to be produced globally by 2035.

The growing global commitment to move to EVs requires an unprecedented amount of lithium and other critical minerals globally; however, supply is scarce. Conservative estimates by Benchmarks Mineral Intelligence (BMI) suggest that the supply of global lithium will increase from around 460,000 tonnes in 2021 to more than 4 million tonnes by 2035 (BMI, 2022). Unfortunately, the mining process to extract lithium and exploration requires a long time – currently between one and six years - from investment to extraction. The problem is that current investment in lithium mines is not yet sufficient to achieve the required output. A recent Boston Consulting Group (BCG) report, for example, suggests that demand for lithium will still exceed supply by around 25% by 2035 (Wurzbacher et al, 2022).

As the world's largest producer of lithium – the vital element in the batteries used to power EVs – Australia is almost uniquely placed to make a globally significant difference in cutting carbon emissions. But we're sorely lagging on policies that might increase lithium production. Much of the debate in Australia on how to reduce greenhouse gas emissions has focused on the price of carbon. We suggest that the focus can fruitfully be moved to taxation reform to increase the production of lithium. This can produce a double dividend. If Australia were to use lithium for producing batteries and contribute to the global surge in demand for EVs, it would contribute to decarbonization, thus contributing to the net zero 2050 target, as well as strengthening both energy and national security, via reducing reliance on Chinese supply chains.

2. Australia is the only country that can make a difference in lithium production

Australia is the largest lithium producer worldwide, producing over half of the world lithium in 2021. The next biggest producers are Chile (25%), China (13%) and Argentina (6%). Australia also has the second-largest lithium reserves in the world after Chile (see Figure 2).

Australia has advantages in terms of how lithium is mined. Lithium from Australia comes from ore mining, while in Chile and Argentina lithium comes from salt deserts or so-called salars. Extracting lithium from salars is problematic. In some areas, locals complain about the practice increasing droughts, which, for example, threatens livestock farming or leads to vegetation drying out. Lithium mining in Chile has been questioned by local communities for depleting water resources and draining wetlands (for more details see Blair et al 2022). Compared to Australia, Argentina and Chile also face significant challenges in terms of political and financial stability that threatens lithium production. In the World Bank's 2021 Political Stability Index, Australia ranks top 10, while Argentina 59 and Chile 58 worldwide. The lack of infrastructure, investment and political stability in Argentina and Chile, and the lower environmental impact of Australian mines put Australia in a unique position to ramp up lithium production in order to help meet demand for EVs and make an important contribution to realizing the Global Net Zero target 2050.

3. Australian Lithium: A Matter of Energy and National Security

Australian lithium production also has the potential to contribute to strengthening national security at a time of increasing concern about reliance on Chinese supply chains. China is a major supplier of lithium and lithium batteries, including to the United States. A consequence of the global move towards transport electrification is that lithium and batteries production are likely to became critical for both energy security and national security. The fact that Australia produces more than half of global lithium presents us with the opportunity of being an essential strategic partner in this space for not only the United States and United Kingdom as an extension of the AUKUS security pact but also the European Union, Japan and the Asia Pacific more generally.

Batteries supply chains are concentrated around China, which produces three-quarters of all lithium-ion batteries. With geopolitical tensions escalating between AUKUS and China, as well as NATO+ and Russia, the risk of chain supply disruption is high. Increasing Australia's lithium production can secure our competitive advantage via reducing reliance on Chinese supply chains.

4. Critical Minerals Taxation

Australia needs policies that will immediately increase investment in lithium production. One way to maximize the positive externalities that are generated by lithium (and other critical minerals) production in terms of reducing global carbon emissions is through taxation reform. Much of the taxation debate in Australia concerning the mining sector has focused on a carbon tax – designed to increase the price of carbon and get firms to switch to renewables. Little attention has been given to tax breaks or subsidies designed to increase lithium production, which can contribute to realizing the same outcomes in promoting renewable solutions.

Australia has made grants designed to boost lithium production under its Modern Manufacturing Initiative, which supports projects integrating Australian businesses into domestic and international value chains (Australian Government, 2022). However, according to Constable, T. (2022) the effective tax rate for the mining sector is 51% (including corporate tax and royalties), which is unlikely to stimulate the investment needed to catch up with the increase in global lithium demand needed for EVs and other uses.

More generally, intuitively, for Australia, with only 0.33% of the worldwide population but with a significant proportion of critical world resources, the benefits to the rest of the world of increasing production of ion lithium and other critical minerals are much more important than the benefits of extra tax collection. This requires a different way to see taxation.

5. A Decarbonization Tax Discount

We propose a decarbonization tax discount (DTD) as an efficient and easy-to-implement solution for critical mineral producers to capitalize on this enormous opportunity. Although this article focuses on lithium as the most prominent case of critical minerals and being particularly relevant to increasing EV production, we propose that the DTD could be applied to all critical minerals.[1]

[1] We define the DTD as the percentage of tax forgone for critical mineral production that is positively consistent with the value generated by the contribution to global decarbonization (to be estimated).

Specifically, we propose introducing a DTD consistent with a level of investment/production target, to be established via consensus between the government and industry, and then working back to ascertain the optimal percentage for the DTD consistent with the pre-set target.

Formally, this can be expressed as follows:

$$ERT_{CM} = TI_{CM} * (ETR_{MI} - (DTD_{CM} f(TP_{CM})) \quad (1)$$

Where ERT_{CM} is the effective rate of taxation for critical minerals (CM), which includes corporate tax and royalties. TI is taxable income, ETR_{MI} is the effective tax rate that is currently applied to the mining sector and DTD_{CM} is the decarbonization tax discount needed to achieve the target production agreed via consensus between government and industry, TP_{CM}.

The TP_{CM} can be approximated by assuming that Australia's global lithium market share is at 55% and that future lithium production required is consistent with EV production plans of four million tonnes by 2035. This implies a target of 2.2 million tonnes of lithium per year by 2035.

6. Conclusion

We have outlined here is a rationale for a DTD based on the externalities that increasing lithium and other critical minerals could bring. We have provided a brief sketch of what a DTD to stimulate investment in lithium and other critical minerals could look like. Our hope is that it might stimulate debate about how taxation policy could be used to meet the expected growth in global demand for EVs, with positive implications for global decarbonization and energy and national security. Obviously much more work is needed to flesh out the details of what a DTD might look like in practice, including detailed simulations of the revenue implications.

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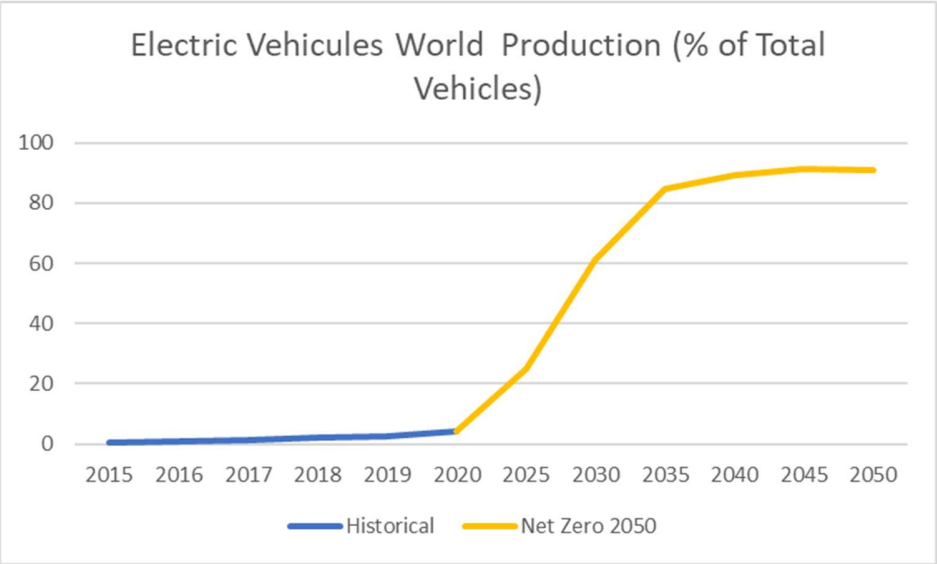
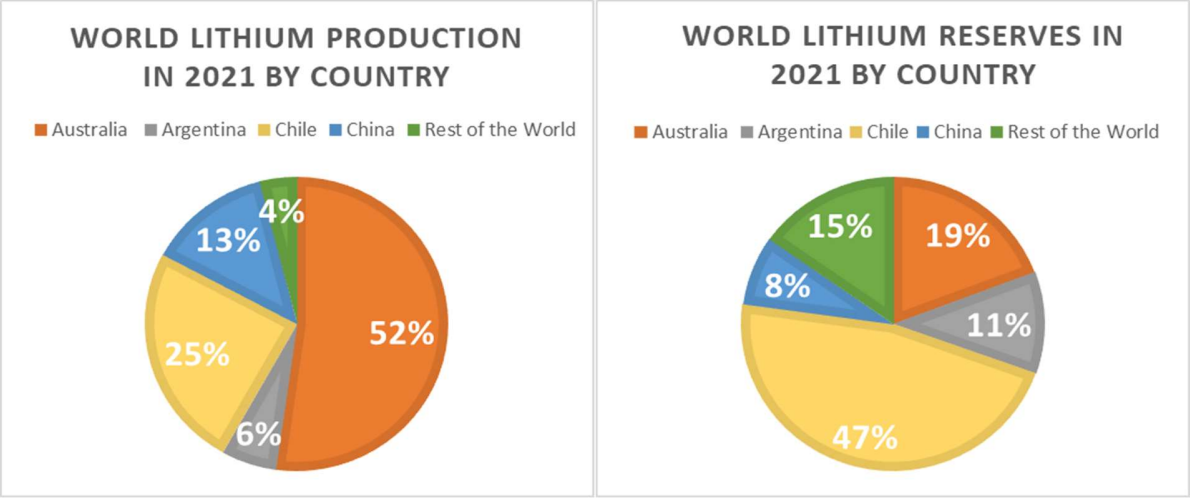
Figure 1: Electric Vehicles Production Consistent with Net Zero 2050



Source: **IEA**, International Energy Association (2022)

Figure 2: World Lithium Production and Proven Reserves in 2021

a) b)



Source: Pistilli (2022) https://investingnews.com/daily/resource-investing/battery-metals-investing/lithium-investing/lithium-reserves-country/