

Tin and tungsten have traditionally received little fanfare in the mining industry. They aren't among the glamour commodities that attract attention. Yet, they have enjoyed some positive press of late, with both now classified as critical minerals that support national economies, national security, and importantly help the transition to low carbon economies.

Tin was recently added to both the US and EU critical mineral lists because of its important role in the fourth industrial revolution: The ongoing automation of traditional manufacturing and industrial practices, using modern smart technology and manufacturing of new technologies. Similarly, tungsten has been included on the list of critical minerals by Australia, the US and the EU due to its industrial and technological applications in global manufacturing industries and its inability to be substituted.

A mineral must be both economically important and vulnerable to supply disruption to be classified as critical. The supply of many critical minerals is geographically concentrated which poses a risk to the global markets in the event of shipping disruptions or policy changes that can be driven by demand for domestic supply reserves.

Tin and tungsten in the modern world

Tin is recognised as fundamental to the battery revolution and electric vehicle manufacturing, and is the key component of solder which is the glue that connects electronic circuits.

Given tungsten's extremely high melting point it has important uses in modern technology such as smartphones, cars and even spacecrafts. It is also commonly used commercially in drilling, fabrication, defense, and construction due to its almost unmatched hardness – comparable to a diamond.

Although little known or commonly forgotten, tin and tungsten are firmly embedded into our daily lives and might be for some time.

One iPhone has 0.7 grams of tin and 900mg of tungsten. Apple delivered 55.2 million iPhones in the first quarter of 2021, a significant year-on-year increase of 50.4 per cent. Amid a global semiconductor chip shortage that is expected to persist throughout 2022, Apple and Samsung have continued to increase their semiconductor chip spending.

The cumulative demand from technologies and EVs added to the consistent needs from industrial and construction projects has manufacturers demanding supplies of tin and tungsten at rates projected to outpace the development of mining projects to extract them.

The supply balancing act

China is the world's largest supplier of raw materials and leads both the tin and tungsten market supply. Output in the Myanmar mining precinct continues to decline, putting a squeeze on domestic supplies. This has prompted the Chinese government to introduce new export conditions.

Consequently, governments in the EU and US are seeking to reduce their reliance on China and strengthen and diversify critical minerals global supply chains.

Australia's abundant deposits of tin and tungsten provides an opportunity for Australian explorers to step in.

Super charged tin prices

The tin price is hit at all-time high of over \$44,000, per tonne on the London Metal Exchange.

The increased use of tin in lead-free solders is the chief driver of tin consumption. Soldering of electronics has been the fastest growing application of tin, taking up half of the world's supply.

The recent rise in tin prices is not solely demand driven. There is currently about two day's global supply of tin held in stockpiles by the London Metal Exchange. The near disappearance of tin stockpiles has sparked a global recycling trend that is unlikely to keep pace with the demand, which is expected to exceed 400,000 tonnes per year by 2025. The International Tin Association expects a deficit over the next decade.

No substitute for tungsten

Tungsten's qualities and durability make it irreplaceable in industrial applications.

China holds approximately 51 percent and produces 82% of the world's tungsten. Such a large reliance on one country with a history of export controls prompted tungsten's addition to the critical minerals list.

Australia's tungsten resources are the second largest in the world, accounting for 11 percent of global tungsten reserves.

The impact in Australia

Few Australian explorers have been actively looking for tin and tungsten at a time when copper, gold and battery metals were attracting high prices. Australian producers face a common prioritisation issue: being restricted by high capital costs of developing an underground mine.

Sustainable sourcing is also a factor that will become prevalent. Larger end users are experiencing a greater demand for supply chain transparency from their stakeholders and will seek to initiate contracts with conflict-free metal producers to align their operations with ESG programs. Australian producers who employ responsible mining practices will set themselves apart from other mines in higher sustainability risk areas.

In response, Venture Minerals has refocused its approach to developing its flagship asset, the Mount Lindsay Tin-Tungsten Project in Tasmania.

Already listed by the Australian Government as a Critical Minerals Project, Mount Lindsay is one of the world's largest undeveloped tin deposits containing more than 80,000 tonnes of tin metal and a globally significant tungsten resource containing 3,200,000 metric tonne units of WO₃. Venture owns 100 percent of the tenure and surrounding prospects.

The project is well positioned to meet the demands of those seeking products containing materials derived from environmentally sustainable mining practices. Our mine has access to Tasmania's abundance of renewable hydropower.

Venture Minerals is committed to working transparently with its stakeholders and minimising its environmental impact through planned underground mining and tailings processing strategies.

With more governments around the world making progressive commitments to lowering their emissions as well as innovating and producing green and renewable technologies, explorers and producers of tin and tungsten will be as critical as the minerals they are producing.