Table S1 Supply risk assessment studies

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| Risk indicator | References |
| Country concentration | U.S. Deparment of Energy (2011), Graedel et al. (2012), Moss et al. (2013), Harper et al. (2015), National Science Technology Council (2016), Habib et al. (2016), Rabe et al. (2017), McCullough and Nassar (2017), Yan et al. (2021), Althaf and Babbitt (2021), Yu et al. (2021), Zhang, L. et al. (2022) |
| Country risk (social and political factors) | U.S. Deparment of Energy (2011), Graedel et al. (2012), Moss et al. (2013), Goe and Gaustad (2014), Harper et al. (2015), National Science Technology Council (2016), Habib and Wenzel (2016), McCullough and Nassar (2017), Blengini et al. (2017), Cimprich et al. (2017), Yan et al. (2020), Yan et al. (2021), Althaf and Babbitt (2021), Yu et al. (2021), Zhang, L. et al. (2022) |
| Depletion time | U.S. Deparment of Energy (2011), Graedel et al. (2012), Goe and Gaustad (2014), Harper et al. (2015), Habib and Wenzel (2016), Yan et al. (2020), Althaf and Babbitt (2021), Yu et al. (2021), Zhang, L. et al. (2022) |
| By-product dependency | U.S. Deparment of Energy (2011), Graedel et al. (2012), Harper et al. (2015), Nassar et al. (2016), Fu et al. (2019), Althaf and Babbitt (2021) |
| Company concentration | U.S. Deparment of Energy (2011) |
| Demand growth | U.S. Deparment of Energy (2011), Moss et al. (2013), Yan et al. (2020), Althaf and Babbitt (2021) |
| Recycling | Goe and Gaustad (2014), Blengini et al. (2017), Sprecher et al. (2017), Mancheri et al. (2018), Yan et al. (2021), Yu et al. (2021), Zhang, L. et al. (2022) |
| Substitutability | Graedel et al. (2012), Harper et al. (2015), Nassar et al. (2015), Blengini et al. (2017), Sprecher et al. (2017), Mancheri et al. (2018), Yan et al. (2021), Yu et al. (2021) |
| Import dependence | Graedel et al. (2012), Goe and Gaustad (2014), Harper et al. (2015), Nassar et al. (2015), Cimprich et al. (2017), Yan et al. (2021), Yu et al. (2021), Althaf and Babbitt (2021) |
| Commodity prices | Henckens et al. (2016), Sprecher et al. (2017), Mancheri et al. (2018), Althaf and Babbitt (2021), Zhang, L. et al. (2022) |
| Production costs in extraction | Sverdrup et al. (2017) |
| Investment in mining | Yu et al. (2021) |
| Stock keeping | Sprecher et al. (2017), Mancheri et al. (2018), |
| Market balance | Sprecher et al. (2017), Mancheri et al. (2018), |
| Production capacity | Moss et al. (2013), Sverdrup et al. (2017), Choi et al. (2018), Yan et al. (2020), Althaf and Babbitt (2021) |
| Environmental sustainability | Graedel et al. (2012), Yu et al. (2021), Althaf and Babbitt (2021), Zhang, L. et al. (2022) |
| Abundance in earth’s crust | Althaf and Babbitt (2021) |
| Trade risk | Geenen (2012), Klimek et al. (2015), Rabe et al. (2017), Schutte (2019), Li et al. (2021) |
| Resources competition | Huang et al. (2021), Liu et al. (2021), Shao et al. (2021), Zhang, H. et al. (2022) |
| Ore concentration | Althaf and Babbitt (2021), |
| Thermodynamic rarity | Calvo et al. (2018), |
| Supply chain resilience | Yan et al. (2020) |

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