Increasing supply: Status quo of supply and the beginning of recycling and research of alternative technologies
2012-2015
Bigger REE mines come begin producing at full capacity, increasing supply.
Exploration of land, oceanic, and cosmic deposits continues.
Illegal and dirty mines will begin to shut down or be legalized.
Greener mining technologies increases.
-Stockpiling of strategic minerals increases.
-Plans for funding an environmental mine clean up group will be drawn up.
-A point system for green mining technology established.

-Recycling for those elements with available technologies.

-EU passes new bills funding research on electrical waste.
-WTO trade disputes have been settled.
-Research for alternative strategic mineral technologies, greener mining + refining techniques, and deep sea extraction technology continues.
-An open information exchange board is formed along with a five-year stipend program.

Addressing supply shortage: mining + refining, recycling, sharing research, alternative technologies
2020-2035
-Protests should have shut down most dirty mines.
-New mines will be opening, old ones shutting down (10-20 year cycle).
-Deposit investigation contines worldwide.
-NASA lands an astronaut on an asteroid.
-Strict regulations are established by SMA for ocean mining and new technologies are developed based on research into deep-sea mining.
-First mine cleanup project. Previously illegal and dirty mines reopen.
-Greener mining + refining techniques become more commonplace, stricter standards (SMA) are applied to new mines opening based on point system incentives.
-By 2030 one third of the world's refineries will be using solid phase technologies or bioleaching with a 68% average recovery rate.

-Based on past recycling trends, by 2020 platinum recycling rates should have increased 50% to 60 tonnes a year.
-In 2020, the EU collects 10 million tons of electronic waste to recycle.
-India's phosphorus use will have leveled off and 50% will be recycled.
-90% of Europe and 80% of N. America's waste water will be recycled into usable phosphorus.
-End-product producers of technologies using strategic minerals will have a stable recycling plan in their factories.
-Recycling and alternative technoogies will be larger parts of supply.

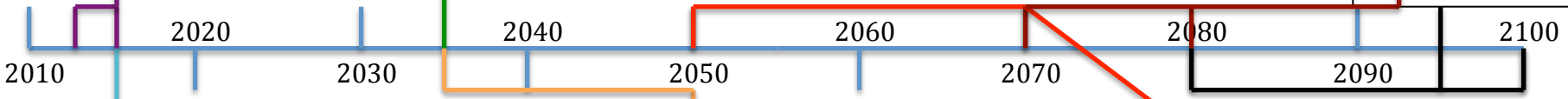
-Supply shortages may replace current technology (with REEs in particular) with more expensive and less efficient technology while research and implementation continues for better alternatives.
-India will have a functioning thorium based fission reactor (by 2020) with more to be developed based on the success of the first one.
-Research will continue, information will be exchanged at research symposiums as part of the open information exchange.

New sources of supply: primari recycling and alternative techno
2070-2080
-Mining has been shifted towards economically feasible deposits, wh demand has made feasible to deve
-No more high grade phosphorus are left (>25% ore).

-Recycling is now a major compon the supply for strategic minerals.

-Alternative technologies which u strategic minerals will replace cur technologies.
-Thorium will be used as a partial substitute for uranium in power p
-Strategic minerals are available o free market for any and all who ch purchase them, at affordable price middle class family.

Supply of strategic minerals is n a barrier to development of any
2080-2100
-Supply comes mainly from recycl alternative technologies, versus m strategic elements. A lack of strate minerals is no longer a barrier of an aspiring nation to be developed



Mining and recycling continues, regulatory bodies are formed
2015-2020
-Mining of strategic minerals continues.
-Exploratory deep-sea mines are developed.
-Near earth asteroid mining prospects are determined.
-USGS will have complete geological surveys of probable phosphorus, lithium, and REE deposit areas.
-There will be a commodity exchange of strategic minerals.

-Recycling programs should be up and running for most strategic minerals.
-Phosphorus use in China will have leveled off due to smarter fertilization techniques + recycling of waste material.

-The international body for strategic minerals (SMA) will be established as an organ of the UN. It will deal with regulations concerning worker safety, environmental concerns, mining, and trade.
-Research continues, sharing through the Open Information Exchange Project.

Continuation of Supply: mining, refining, and recycling advances
2035-2050
-Mining continues as new deposits are discovered.
-Illegal mines will be shut down, or legally regulated.
-Further expansion of deep-sea mines.
-Infrastructure for further space exploration and asteroid mining is developed and by 2045 is usable.
-Environmental regulations combined with greener mining techniques in all open mines will reduce mining's environmental impact.
-Shut down mines will be cleaned and reclaimed by the local community.
-Refining techniques for REEs will be established and no longer costly in time, money, and environmental damage.
-Half of refineries will have converted to solid phase technologies or bioleaching with a 75% average recovery rate.

-Manufacturers will have established recycling programs in underdeveloped nations as well as developed nations.
-Global phosphorus consumption peaks and begins to decline with an increase in recycling and better usage of waste products.
-Recycling technologies for all strategic minerals have been developed and are implemented, with varying degrees of success.

-Alternative technologies make advances, certain technologies like Nd-Fe-B have viable substitutes, which use fewer strategic minerals or none at all.
-Thorium is slowly replacing uranium in nuclear power plants.

Changing Supply Sources: focus on mining and refining shifts to recycling and alternative technologies
2050-2070
-Exploration will have established a good estimate of reserves left for most strategic elements.
-Mining continues for all elements, although competition has reduced prices for end-products, even for scarcer elements like REEs. Development is that much more achievable for countries where end-products are currently out of the price range (i.e., developing countries with a small middle class).

-Recycling process reduces amount and size of remaining landfills.
-Recycling is now a stable source for REEs, rare metals, phosphorus, and platinum such that supply is no longer solely dependent on mining.

-With R&D funded early on, new alternatives are now produced, with reduced or completely cut use of strategic minerals, that have increased efficiency and lowered costs compared to current technologies.