Natural Resources in the Global Economy

Debate 2: This House believes that there is no need for concern about the future global supply of strategic minerals

2 November 2011

Bullet point reference

Arguments for the motion

- There is no shortage in terms of world stocks of metals and minerals, even if the distribution and supply are not ideal
- Concerns about shortages of various minerals and commodities have been around for at least two centuries and have all so far proved to be false
- Fears of shortages have tended to underestimate the capacity of mining companies to innovate in terms of extraction technologies and the capacity of users to innovate in terms of materials substitution
- Most estimates of reserves are culled from stock market reports from publicly-quoted companies. These underestimate reserves because companies don’t declare assets they are not developing and private companies’ or government stocks are not always known
- The market for strategic minerals tends to self-regulate:
  - Increased scarcity leads to increased prices
  - Increased prices may well lead to lower usage
  - Increased prices also bring more marginal and lower grade sources into production
  - Increased prices also drive innovation into increasing extraction from existing sources
- Mining and extraction benefit from economies of scale, so bigger, more concentrated resources are more efficient
- New technologies enable extraction from reserves previously considered uneconomic
- Recycling is in its infancy: while 70-90% of ferrous materials are recycled, less than 50% of non-ferrous metals are recycled and for important metals such as platinum the figure is less than 5%
- Recycling rates are set to improve hugely: from 2015 for instance 95% of materials in a car in Europe will have to be recycled at the end of the vehicle’s life.
- Developments in California and Australia will circumvent potential problems with rare earths by 2014
- Developing countries will not make the same mistakes as the currently developed countries in terms of their use of strategic minerals and their patterns of usage are likely to be very different
- If land-based assets were in short supply, there are still vast potential reserves of many minerals in seawater, though we currently lack the technology to recover these economically
Arguments against the motion

- While it’s agreed that world stocks of strategic minerals and metals are such that we will not run out, it is rash to expect high growth in demand to meet without mismatches of supply and demand.
- One study says that from now up to 2050 the world will consume more minerals than it has so far in all of history.
- It’s difficult to mobilise investment in mining, particularly in new sites, with permits taking a long time and more care being demanded for local communities.
- Mining developments often take place in regions where there is a lack of other infrastructure, from water supplies through to skilled labour.
- Resource nationalism creates uncertainty and producer countries increasingly want to retain more of the benefits from minerals, sometimes at the expense of exports.
- It’s increasingly difficult to identify what is a strategic mineral and what isn’t: for example, chips in the 1980s used 12 basic minerals, in the 1990s 16 and now up to 60.
- Governments after the collapse of the Soviet Union seemed to consider problems of strategic minerals to be a thing of the past, but the reality was that the situation became even more complicated.
- It’s not unreasonable to foresee a period of strategic rivalry between China and the West, and China is now the lead producer in one report of 27 of 52 identified strategic metals.
- There are particular problems in China’s domination of rare earths.
- China has already demonstrated in temporarily blocking access to strategic minerals by Japan that it is willing to use access to minerals as a weapon in disputes that have a different origin.
- The economic model for higher prices sorting out the supply problems does not work for rare earths where there are only very small markets and in some cases only very small reserves.
- Some of the rarest of the rare earths such as europium, gadolinium and yttrium are as yet irreplaceable in the high-tech applications in which they are used.
- There are large and wide-ranging skill shortages across the whole area of minerals extraction and refining.
- While “anyone can dig a hole”, many strategic minerals rely on unique processes and require specialist knowledge, such as the disposal of radioactive wastes.
- In one area of skill shortages alone, the supply of minerals engineers, the US and Australia produce between them no more than 40 a year, while China is producing up to 3,000.
- Subjects such as the extraction of rare earths are not regularly taught in UK engineering syllabuses, but are commonplace in China.

Points emerging from the discussion

- When very small amounts of material are being widely dispersed in products such as mobile phones, recovery through recycling may be all but impossible.
• China is “playing to different rules” and its strategic minerals policies reflect the fact that it, unlike other countries, does not trust the market to ensure a balance between supply and demand.
• Demand management and forecasting are much more difficult than supply management and forecasting.
• Demand for strategic minerals can be influenced by changes in people’s behaviour and by legislation.
• Issues about strategic minerals cannot be seen in isolation from other issues in, for example, energy supply, the environment and social impact.
• A limiting factor on mineral extraction in the medium term may be the extent to which there is enough wealth to be able to generate the necessary investment.
• Mining companies are now taking a much more responsible attitude than they used to towards the communities affected by mining activities and the legacies they leave behind.
• It’s questionable whether future demand even for well-known materials can be extrapolated with any confidence from past demand, since factors such as energy density will change with advances in materials technology such as nanomaterials.
• Manufacturers (and politicians) may make bad decisions based on false reports that certain materials are in danger of running out; the media are keen on scare stories, when the reality is more complex.
• There needs to be a greater emphasis on design for recycling.
• Skills shortages are not just in narrow specialisms within minerals engineering and science, but more widely in project management.