Report of the UK Minerals Forum
Security of Supply Working Group
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Introduction

1. Energy, non-energy raw materials and food are essential prerequisites for all economic activity and quality of life, and ensuring secure and sustainable supplies must be a top policy priority for any government.

2. Concerns about the security of Britain's supplies of raw materials have a long history. They were heightened at times of world conflict and political instability, stimulating innovation and renewed interest in indigenous mineral resources, but were by no means confined to such periods. After the Cold War and a long period when it was generally assumed, through globalisation, that 'the market would provide,' security of supply is once more a real concern. This has been primarily stimulated by the UK's declining oil and gas reserves and the country's rapid transition from energy self sufficiency and surplus to a major importer of oil and gas (and coal). The global economy is also changing. Rapidly increasing demand and competition for resources, particularly from emerging economies such as China and India, is resulting in price increases for a wide range of commodities and food. With increasing world population and rising aspirations, competition for resources will intensify. Suddenly we feel more vulnerable. Indeed 'security' in its widest sense, together with climate change, are becoming the defining themes of the start of the 21st century.

Security of supply

3. But what is meant by 'security of supply' and what types of minerals might be considered as strategically important? Deliberations during the Cold War came up with a useful definition for so-called 'strategic minerals.' These were defined as those minerals whose uses were critical to the economy and whose supplies were vulnerable to disruption. It had two major components:

    - **Vulnerability** – a high proportion of supplies were imported, notably from restricted sources; and
    - **Criticality** – the mineral was essential to the economy.

4. Vulnerability was based on the proportion of domestic consumption, which was imported and the number of overseas supply sources contributing to that supply. The fewer and more unstable the sources the more vulnerable the supply. Domestic production was, therefore, generally assumed not to be vulnerable.

5. The UK and other industrialised nations are increasingly dependent on foreign sources, often few in number, for a wide range of minerals and metals that are critical to their economies. Importing materials requires a supply chain

comprising many different elements which all need to operate effectively to be successful. The longer and more complex the supply chain the more potentially vulnerable it is to disruption, for example through inadequate transport and related infrastructure. Fundamentally, the supplying country must also be willing to export materials and over the long term. There is always a risk that due to changing circumstances the amounts supplied may be reduced. This is well illustrated with respect to China and fluorspar. China is by far the leading world producer and exporter of fluorspar. However, in recent years exports have been restricted as more fluorspar has been diverted to the home market to, understandably, maximise valued-added domestic production of fluorine chemicals. The consequent reduced availability of fluorspar has put pressure on supplies and prices. Unless fluorspar continues to be obtained from UK sources continued fluorine chemical production in the UK is threatened.

Strategic considerations

6. Our industrialised society consumes a wide range of raw materials, which support downstream industries of varying degrees of importance to the economy. The twin concepts of 'criticality' and 'vulnerability' still provide a valuable method of determining how strategically important specific minerals are to the economy. During the 1980s 'strategic minerals' were identified as mainly ferroalloy elements, such as Cr, Mn and V, because of their use in the strategically important steel industry and their restricted sources of supply. Indeed the Government maintained a stockpile of some of these minerals and metals between 1983 and 1996.

7. In the 1980s with a large coal industry and rapidly expanding offshore oil and gas production, energy despite its clear strategic importance, was not a great concern. Today things are very different and energy minerals, notably oil and gas, are the main focus of our concerns. Rapid depletion of the UK's gas reserves through their use in electricity generation (the 'dash for gas'), the consequent need for imports and the lack of forward planning for gas storage facilities to provide supplies in peak periods, all have made the UK vulnerable to price increases. This, in turn, has impacted on the competitiveness of UK manufacturing.

8. Coal-fired energy generation makes an important contribution to the UK's energy security. However, its long-term future will depend on managing its carbon impact through clean coal technology. Coal imports now account for about two-thirds of consumption but the UK Coal Forum had concluded that due to the availability of coal worldwide, coal from overseas can be regarded as secure. Nevertheless, the recent rapid rise in international coal prices is indicative of a much tighter supply/demand balance which may lead to security of supply concerns and which has made UK production highly competitive.

9. So if all imports are vulnerable to a degree, domestically produced minerals should, by this definition, be secure. But is this true?

Indigenous minerals

10. A wide range of minerals is produced in the UK and provide essential raw materials with varying degrees of criticality for many different sectors of the economy. The importance of energy raw materials for electricity generation and transport cannot be understated. However, the success of any modern economy is also dependent on the quality of its infrastructure and built environment. The outputs of the construction industry are vital if other aspects of the economy are to function well and economic growth facilitated. Like energy minerals, therefore, on any measure of criticality construction minerals, notably aggregates but also cement and cement raw materials, would appear high on the list. However, almost all minerals whether chemical feedstocks, such as limestone, salt and fluorspar, or silica sand for glassmaking, have a crucial role in one or other sector of the economy.

11. UK sourcing of minerals brings obvious benefits, not least in terms of self-sufficiency and security of supply, but importantly by contributing to the economy through employment - both directly and indirectly, national income and investment. Indigenous minerals support a broad range of manufacturing industries in the UK, which would be vulnerable and at a competitive disadvantage and possibly close, or relocate abroad, if they could not source minerals locally with the resultant loss of jobs and future investment.

12. There are, however, wider considerations. The UK is increasingly importing its raw materials, thereby transferring the environmental and social impacts of production to the country of origin. 'Securing the future – UK Government sustainable development strategy' published in 2005 states that environmental policy should encompass impacts outside the UK - *"There would be little value in reducing environmental impacts within the UK if the result were merely to displace those impacts overseas…."* These impacts include the carbon costs associated with extracting, processing and transporting minerals, as well as manufacturing.

13. It is important that we make the most of our indigenous mineral resources, by realising their value as mineral assets and recognising that a healthy domestic minerals industry is the most sustainable way to supply the market. So focusing on the supply of indigenous minerals - are they vulnerable and what are the factors that control their supply.

Factors affecting the supply of indigenous minerals

14. A number of factors affect the supply of indigenous minerals. Adequate reserves and production capacity, i.e. sufficient mines/quarries to extract and process minerals in the right quantities, qualities and at the right time to meet demand, is clearly crucial. Fundamentally, this depends on the availability of land with workable deposits and with the necessary planning permissions for minerals extraction.

15. Five fundamental factors affect the continuity of supply of indigenous minerals.

- Resource availability – the location of resources is dependent on geology, with no resources there can be no production.
- Demand - if there is a market there is a need.
- Economic viability – can the mineral be produced profitably and competitively in global, regional and local markets. There can be no question of subsidising domestic mineral production.
- Investment – are the risks sufficiently acceptable to justify significant capital investment over the long term.
- Access - crucially access to reserves through a licence to operate, by securing an agreement with the mineral/landowner and through the provision of adequate planning permissions to sustain production.

Resource availability

16. The location of a mineral deposit, together with its size and quality, is determined by geology. If there are no workable resources there can be no production.

17. The UK is fortunate in being relatively well endowed with a wide range of minerals that can be worked profitably. They exhibit a range of geological availability from abundant to scarce. Hard rock resources suitable for crushed rock aggregate are extensive, albeit unevenly distributed, with hard rock being deficient in southern and eastern England where demand is high. In sharp contrast fluorspar resources, occurring as relatively narrow veins, are scarce and geologically constrained. Resource availability also needs to be considered in terms of grade/quality. Silica sand resources that meet the demanding requirements of the colourless glass industry are much scarcer than silica sand overall. Different qualities of the same mineral are often not interchangeable in use.

18. An important element of ensuring long term supplies of minerals is protecting mineral resources against unnecessary sterilisation and also safeguarding the means for their distribution within the UK. Safeguarding policy has been greatly strengthened in 'MPS1: *Planning and Minerals*' and similar polices exist in Scotland and Wales. The identification and safeguarding of all mineral resources and their means of distribution will help to ensure supplies for the future. It also retains the flexibility to identify areas for working which will have the least environmental impact.

Reserve availability and competition for access to land

19. A number of factors, in addition to resource availability, determine whether a site can be worked and whether a potentially workable resource can be converted into a permitted reserve and its latent economic value released. A resource will only be developed if it has access to an economically viable market, which can be supplied competitively and profitably, and the necessary capital is available to develop the site. Consequently a stable financial and

regulatory environment is also essential if the minerals industry is to make the substantial and necessary investments required to meet the nation's long-term need for minerals. This requires a degree of certainty and clarity in policies at European, national, regional and local level in order to justify significant capital investment. This is an increasingly important factor, particularly as the UK minerals industry is now largely in foreign ownership.

20. However, it is legal access to a site that is the fundamental determinant of creating productive capacity through permitted reserves. The agreement of the land and mineral owner must be obtained. Many landowners may not wish to see their land developed, particularly if it is either well located for other uses or, as is increasingly likely, needed to maximise food production. Mineral development may thus be the option of last resort. Crucially, however, it is gaining planning consent and creating permitted reserves that is essential for sustaining production. Access is a central and recurring concern of the minerals industry as it finds it increasingly difficult to find environmentally acceptable sites, both onshore and offshore, to work. In the longer term it threatens continuity of supply through declining reserves and the ability to sustain UK industries that depend on minerals.

21. The population of England, already one of the most densely populated countries in the world, is forecast to increase significantly. Whilst this population itself creates substantial demand for minerals it also results in increasing competition for land. There is widespread opposition to development and minerals related development in particular. Environmental designations, such as National Parks and nature conservation designations, notably Natura 2000 sites, are also a major consideration in the access to mineral resources. The location of many mineral resources coincide with these designations and together with other land use issues their cumulative impact is restricting future development options for mineral development and supply.

The importance of environmental and planning policy

22. Policies at European, national, regional and local level that affect mineral production have a crucial bearing on the long-term continuity of supply. Government has, therefore, an important role to play in balancing the need for indigenous mineral production within sustainable development and is faced with many difficult and competing challenges. There are pressures for more development – housing, industry, infrastructure and flood defence – whilst others for greater protection of the environment. Climate change is now the first priority and it may be that it becomes more important than the landscape. Carbon cost is an increasingly important issue which may focus on localising supply, where feasible, with a requirement to transport minerals, particularly aggregates, shorter distances (proximity principle) or, if this cannot be achieved, then by more sustainable means.

23. A key function of the planning system is to ensure that sufficient land is made available for mineral working to secure an adequate and steady supply of minerals while satisfying a range of Government policies on environmental protection and contributing to the achievement of sustainable development.

Although minerals underpin the economic prosperity of the nation, geology dictates that mineral extraction does not always have the locational flexibility of most other forms of development. The extraction and transport of minerals almost always has some potentially harmful environmental impacts. In addition, their ultimate consumption may not be in the local area, region or even country where an export market is important. Clear policy objectives and guidance, particularly at national, but also regional level, are therefore crucially important.

24. There is no overarching national minerals policy for the whole of the UK. Minerals policy guidance is specific to the devolved administrations and relates to either minerals in general or, in some cases, specific minerals such as aggregates and coal. Not all minerals have specific guidance, creating perhaps a perception that these are not as important. There is, in general, strong support from the minerals industry and some planning authorities for a clear 'Statement of Need' from Government on the availability of continuing supplies of specific minerals to meet national demand. However, there is not complete agreement but, at the very least, regional and mineral planning authorities are seeking enhanced clarity and guidance which can be taken into account in preparing planning strategies and in deciding individual planning applications, particularly in sensitive areas.

25. The Government's objectives and planning policies for all minerals in England are set out in Minerals Policy Statement 1: *Planning and Minerals.* A key objective is to provide continuity of supply, which is encapsulated in the statement *"to secure adequate and steady supplies of minerals needed by society and the economy within the limits set by the environment, assessed through sustainability appraisal, without irreversible damage"*. Similar policies exist in Scotland and Wales. Some would argue that this provides a sufficient 'statement of need' but the fact remains that some minerals have specific guidance whilst others do not. In particular in England the specific policies for aggregates in MPS1 are supplemented by a system of managed aggregates supply, which provides *Guidelines* for likely future requirements. This helps the planning system address effectively the imbalances in aggregates supply and demand at national and regional level to ensure continuity of supply. It is widely accepted that this system has worked well since it was introduced in the 1970s. It promotes long term planning, providing a degree of certainty and encouraging investment and planning applications in places, which are more likely (rather than less likely) to be granted. The *Guidelines* also provide a 'statement of need', which operators at least regard as a key strength, eliminating a potential area of dispute, which is particularly important when a product is being used remotely from the supplying area.

26. On the other hand, specific guidance for coal includes a presumption against approval unless the proposal is environmentally acceptable, or can be made so by planning conditions or obligations or, if not, it provides overweighing local or community benefits. The test is subject to misinterpretation and may be one reason for the decline in surface mined coal in particular, in recent years.

27. Planning authorities and elected representatives need to be aware of the downstream economic consequences of their decisions on planning applications. What would benefit the industry and planning authorities, as well as informing Government, is some form of official strategic assessment of specific minerals and the key industries and markets they support. This would provide transparent information on which balanced judgments could be made and hopefully assist in planning for the nation's longer-term mineral needs. Our indigenous mineral resources are valuable national assets; we should be making best use of them where economically viable and environmentally acceptable to do so. The management of the nation's mineral resources need to championed like other assets such as landscape, heritage, wildlife and water.

28. In contrast the planning system has become more complex since the introduction of the Planning and Compulsory Purchase Act 2004. Many Local Authorities have struggled to produce Minerals Development Frameworks within a reasonable timescale and the disruption to Mineral Planning Authorities arising from the trend towards the creation of Unitary Authorities has weakened the ability of Local Authorities to deal effectively with establishing Minerals Development Frameworks and dealing with planning applications. The creation of unitary authorities may have also weakened their ability to arrive at decisions on applications that have more than local impact. This is also coupled with a shortage of professional and experienced mineral planning staff within MPAs and, to a lesser extent within industry.

Mitigating security of supply

29. A key aspect of providing security of supply is the provision of landbanks of permitted reserves for specific minerals. All MPAs are encouraged by Government policy to ensure that the minerals industry is granted sufficient planning permissions to ensure that the market is supplied at the required rate and so the objective of continuity of supply is achieved. In addition to landbank policies for aggregates and selected non-energy minerals, such as silica sand and cement raw materials, there are a number of other ways of contributing to overall security of supply.

    - Widening the resource base
    - Resource efficiency
    - Increased recycling
    - Diversifying supply

30. In general the mineral resource base in Britain has become more constrained as environmental and amenity considerations have increasingly been taken into account. However, technical innovation and changing economics could open up new possibilities with underground mining of aggregates, dredging of marine aggregates at greater depths and the underground gasification of coal inaccessible by conventional mining all examples.

31. Resource efficiency means doing more with less and higher rates of recycling. Alongside improved recycling, notably of aggregates, the UK economy has

changed significantly in recent decades with a decline in production industries and manufacturing and a rise in the contribution of the services sector. This has been associated with a decline in the consumption of mineral raw materials. Despite major growth in the economy Domestic Materials Consumption of minerals and fossil fuels (domestic extraction +imports-exports) has declined from 616 to 538 million tonnes between 1970 and 2006 with a corresponding increase in materials productivity. Nevertheless the economy still requires large quantities of minerals.

32. Maintaining and, where feasible, expanding supply diversity is a key element of security of supply. With aggregates the UK is fortunate in that a range of sources all contribute to overall supply. Diversity needs to be maintained to keep as many supply options open as possible, which also offers the best prospects for ensuring a healthy, competitive market.

Conclusions

33. Current concerns about security of supply are primarily focused on imported raw materials, notably oil and gas. It would be unwise, however, to assume that there are no impending supply problems at home. Although permitted reserves of many minerals, such as kaolin, ball clay and salt, are very large others are declining and, in the case of fluorspar are perilously low. Reserves of glass sand are comparatively small and permitted reserves of coal are low in relation to the overall level of coal consumption. Reserves of sand and gravel in England have declined by 29% between 1995 and 2005 and in the South East by 60% due to a failure to replenish sales with new permissions for whatever reason. Whilst reserves of crushed rock are overall very large these figures mask both regional and local imbalances in relation to size, production capacity and aggregate quality. There are also important issues about where the next generation of strategic, rail-linked quarries will be sited and their ability to secure sufficient train paths to transport aggregates to the market in the face of pressure from increased passenger traffic. Some of these strategic sites have reserve lives of only 20 years.

34. It is right to make the best use of the UK's mineral resources where economically viable and environmentally sustainable to do so. This will require access to resources through planning approvals and, importantly, planning applications being forthcoming in appropriate locations. We also need a balanced (mixed) supply system to maintain security of supply, which should also include maximising recycling, substitution and resource efficiency. Diversity of supply improves security by keeping more options open. A more holistic approach to mineral supply and waste management would also be highly beneficial. Cement manufacture, for example, not only provides an essential construction material but also the means of disposal of waste as an energy source (e.g. rubber tyres, solvent-derived fuels and sewage pellets).

35. The minerals that are most critical to the national economy are energy minerals, construction minerals, particularly aggregates and cement, and those that underpin industries with a high value added component, such as chemical

feedstocks and glassmaking materials. The most vulnerable are those located almost entirely in designated areas, in particular fluorspar.

36. Minerals are consumed in large quantities and UK industry will continue to require supplies from both domestic and imported sources. Given the complex relationships between the distribution of mineral resources, environmental considerations, infrastructure and the nature of supply and demand, it is difficult to see how future demand can be met in a sustainable way without a strategic, forward planning approach. It is important, therefore, that the nation's raw material needs, whether from overseas or domestic sources, are kept under review. We should monitor and improve our knowledge base on the supply and demand for all minerals and value indigenous mineral resources as national assets. What would be valuable for all stakeholders is a series of concise 'strategic statements,' endorsed by Government, for the range of minerals produced in the UK describing their economic importance and the role they play in supporting user industries. It should be noted, however, that not all members of the Security of Supply Working Group support this view. The view was also expressed that the generic statement on the importance minerals and continuity of supply contained in MPS1 is sufficient.