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# The Foundations of Industrial Strategy to Secure Sovereign Capability and Environmental Sustainability

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## INDUSTRIAL STRATEGY

In shaping the future of Britain we need our industrial strategy to deliver the kind of economy and ultimately the society that we want to live in. This industrial strategy needs to be rooted in some hard foundations: energy, raw materials and trade. It is enabled by people, their innovation and skills and it needs to deliver a prosperous, fair, more equal society, in communities throughout the UK. In this article I intend to focus on these hard foundations of industrial strategy and why securing these resources is fundamental for meeting our sustainability responsibilities to the planet for present and future generations, as well as ensuring Britain maintains its sovereign capability in an uncertain world.

The first and over riding concern is and must be for environmental sustainability. This includes of course the need to reduce carbon emissions, but to do this in a way that has a genuine global impact, not simply by the process of offshoring our own production. Similar weight must be attributed to resource efficiency, where we consider both the environmental and ethical constraints around the production of virgin raw materials and the risk of depletion of scarce resources. Ensuring that our economy is incentivised to achieve the highest standards in resource efficiency, through product design and recycling technologies, must be at the heart of any industrial strategy.

As much as I welcome the introduction by this government of the first UK industrial strategy in decades, it seems strange that it includes a strategy for creative industries, but not for steel.

## ASPECTS OF SOVEREIGN CAPABILITY

### Energy

The bedrock of industrial strategy is an energy policy that supports international competitiveness. This is a theme I explored in June 2018[(1)], when speaking at a policy conference in Westminster, where I looked at the role of energy policy in shaping our economy and its importance post Brexit. Forecasts of energy pricing drive decisions on future investment and the relative competitiveness of energy costs between nations can determine the location of new factories. The difference of a few percentage points in energy prices can tip the balance between profit to loss for energy intensive users, such as steel, glass, ceramics, chemicals and cement.

Fundamental economic competitiveness in this area is important now, but will become far more so as the UK seeks to increase the proportion of trade outside the EU. A level playing field in energy is crucial, but currently energy intensive users in the UK typically pay between £21 and £34 per Mwh more for electricity than their competitors in France and Germany[2] (Fig. 1). This disparity is increasing. It is partly due to higher wholesale cost of energy in Britain and partly due to higher taxes, but mostly it is about higher transmission costs.

In other countries, industry receives a rebate, to recognise the wider economic and social benefits of employment. This does result in relatively higher domestic energy bills, the primary reason cited as to why such a policy is politically unacceptable in the UK. To put it bluntly, the UK prioritises giving people lower energy bills, whereas France and Germany prioritise highly paid jobs.

The opportunity here is for Britain to have a secure, carbon neutral and environmentally sustainable energy supply, delivered at internationally competitive costs. We must acknowledge though that we are currently lagging other nations in this regard and we need to move quickly to catch up.

**Raw Materials**

The second fundamental building block of an industrial economy beyond energy, is access to the materials, such as steel, metals, ceramics and glass, from which to engage in manufacturing and construction activity. There is a direct connection between materials and energy, in that the relatively high energy costs in the UK are a significant factor in the offshoring of materials and other energy intensive industries. That 5% of world electricity is used for mineral processing is an example of the energy intensiveness of this sector.

It is important we acknowledge that in Britain, unlike any other country I have experienced, these industries are placed at a unique disadvantage, due to the perception that they are part of yesterday's economy and are no longer needed. What this means is that we all need to make the case for the continued importance of these industries in a modern industrial economy. This is something I have been doing with some success since the formation of the Materials Processing Institute in 2014, working closely with government and civil servants to provide the evidence for the value of these industries.

The importance of the steel industry in the UK economy was the subject of an article I wrote for the Daily Telegraph in 2016[3] in response to Tata's announcement of the possible closure of Port Talbot just months after Redcar's own crisis, but the case was also well made by Nick Reilly, former head of General Motors in Europe, when, also in 2016, he described the steel industry as essential for UK manufacturing supply chains in automotive and aerospace[4]. In the same year the IPPR published a report[5], which made the case for the wider foundation industries sector and its contribution to the manufacturing economy that runs well into the supply chains, and we have seen more recent championing from the TUC's "All Tomorrow's Jobs" report in late 2018 and the work of Siemens UK CEO, Juergen Maier.

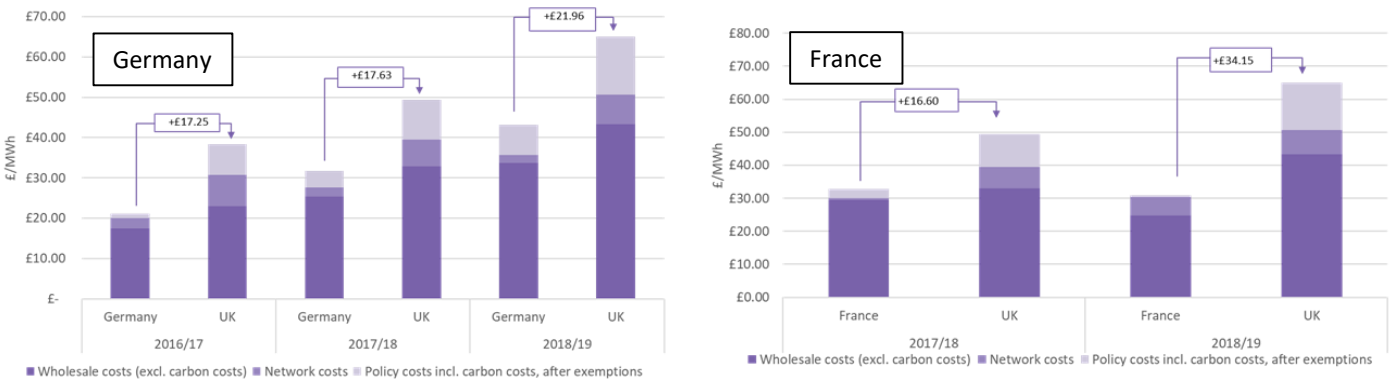



*Figure 1: Electricity prices for UK, French and German Steel producers.*
*After: UK STEEL – The Energy Price Scandal: A Fair Power Deal for UK Steel [2]*

Another aspect of raw materials supply are those less well known, but still critical materials, where supply constraints are an issue, many of which have been identified by the British Geological Survey and includes materials such as: germanium, platinum and neodymium[6] (Fig. 2).

Managing the long term availability of these raw materials was previously considered at the level of the EU, but the territorial bounds on which this now needs to be applied have been reduced to the level of the nation state. This creates a requirement for Britain to unleash the forces of innovation and creativity to understand how these precious materials can be conserved, tracked, separated, reused and recycled, within the bounds of this island. Such an initiative can be part of a much larger drive for a circular economy, with a 'cradle-to-cradle' approach to manufacturing that is not only more environmentally sustainable, but which yields highly efficient and profitable manufacturing.

As an International Trade Based Economy, the UK will experience fundamental change in the way that goods are physically landed on these shores. Export growth will drive infrastructure requirements in air freight, container shipping and bulk carrier, with associated national rail infrastructure. Trading in this way will increase the length and complexity of supply chains. Inventory and logistics management will increase in importance, along with working capital financing and insurance.

Copper sits at the intersection of these factors. Essential for infrastructure investment, its importation requires long supply chains that could be disrupted. The impact of the loss of a cargo of copper billet could be a major disruption to key infrastructure projects. The UK has ample onshore copper resources, from secondary materials, but these cannot be exploited as the UK lacks copper smelting capability due to high energy prices. It is vital that this is recognised as a key part of our sovereign capability and is re-established.

**Trade**

The third foundation for an industrial strategy is trade. Access to markets, technology, skills, innovation and ideas, all stem from trade and countries throughout history have gone to enormous lengths to secure and protect their trading assets. We are living through a time of remarkable change in international trade, driven by a shift in the global balance of power and new, transformative digital technologies.

Considering again the reorientation of economic might to Asia, we have become accustomed, however astonishing, to a situation where economic growth in China has outpaced all expectation. In a period of ten years, China underwent a century of growth and development. We have now reached the point where China is no longer catching up with other advanced economies, it is about to surge ahead.

| *Element* | | *Industrial Application* |
|---|---|---|
| **Antimony** | **Sb** | **Antimony Tin Oxide, flame retardant, micro capacitors** |
| **Cobalt** | **Co** | **Li-Ion batteries, synthetic fuels** |
| **Gallium** | **Ga** | **Thin layer photovoltaics, LED** |
| **Germanium** | **Ge** | **Fibre Optic Cable, IR Optical Technology** |
| **Indium** | **In** | **Displays, thin layer photovoltaics** |
| **Platinum** | **Pt** | **Fuel cells, catalysts** |
| **Palladium** | **Pd** | **Catalysts, seawater desalinisation** |
| **Niobium** | **Nb** | **Micro Capacitors, ferroalloys, high speed low alloy steel** |
| **Neodymium** | **Nd** | **Permanent magnets, laser technology** |

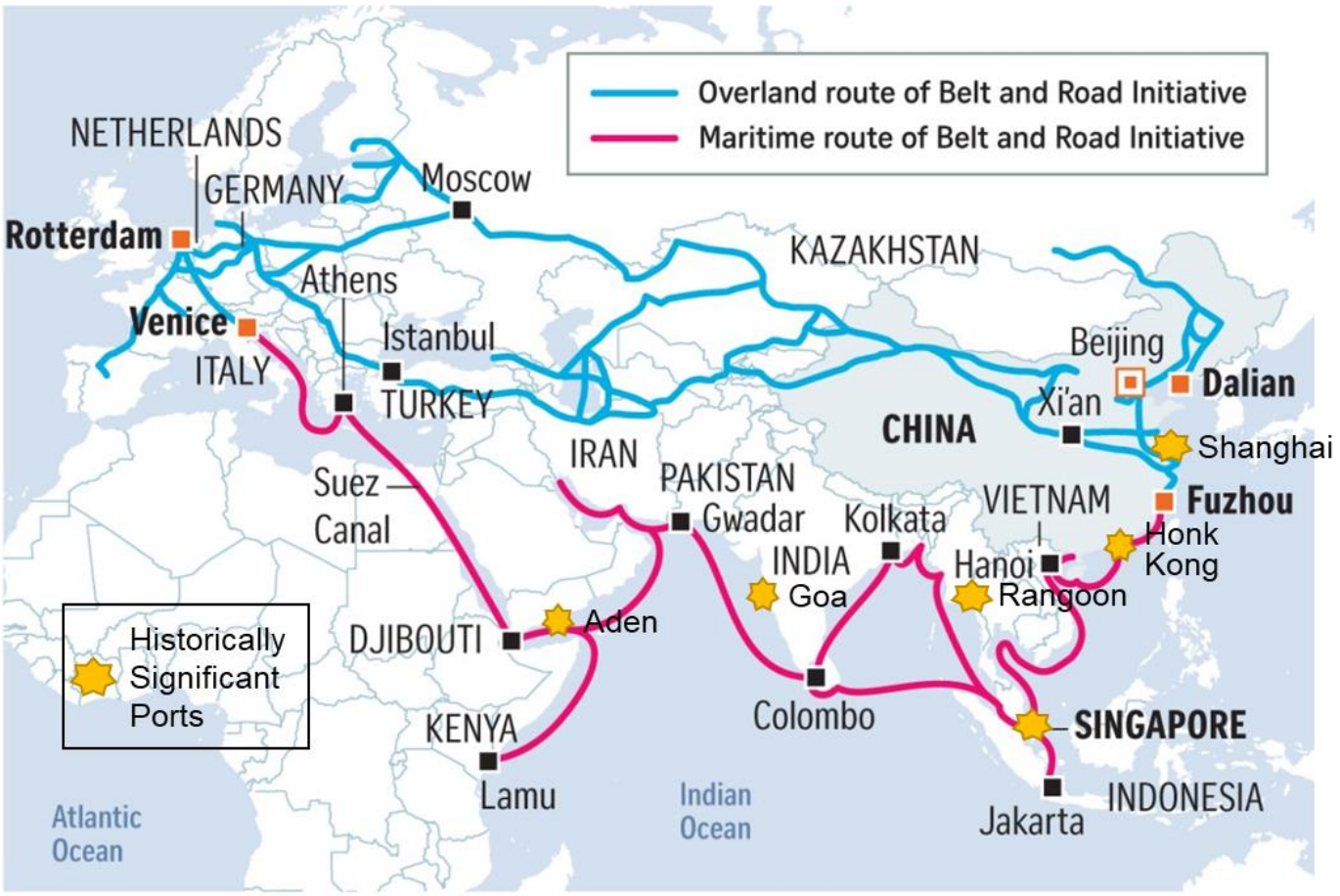
*Figure 2: Raw Materials Considered Critical by the British Geological Survey[6]*

China's trade and foreign policy centrepiece is the 'Belt and Road' policy in its latest five year plan. In early 2016 I raised publicly my concern over the UK's complacency with regard to this policy[7]. My speech at that time followed on from my latest visit to China, where I was able to witness at first hand the rapid pace of growth and development and the complete realignment of industry to support this policy.

The Belt and Road describes investment by China in both sea and land trading routes, stretching across Asia and the Indian Ocean, to Africa, the Middle East and Europe, connecting Chinese industry with both developing and advanced markets. China has developed a sophisticated combination of aid, economic investment and political control, to create and control a network of staging posts stretching from Beijing to Madrid and Rotterdam.

It is and has been UK government policy, to encourage our financial institutions to invest in and support China in developing this new trade infrastructure and yet what short memories we have about the importance of controlling international trading routes. A simple overlay of the Belt and Road development ports, across the formerly British controlled staging posts of Aden, Goa, Rangoon, Singapore, Hong Kong and Shanghai, shows the clear risk to Britain of heading into a global trading backwater.

It is worth reflecting that China's latest five year plan would not be dissimilar to the kind of industrial strategy the UK needs, if we were to articulate how we will achieve our aims of rebalancing the economy and developing capability in advanced manufacturing. The recently established Crick Institute in London will focus on big data. The Sir Henry Royce centre in Manchester, announced in 2015, will undertake similar activity to the 15 innovation centres that China intends to establish for the steel industry alone.




*Map of the overland and maritime routes for China's 'Belt and Road' initiative.*
*(After a diagram originally published in the Straits Times).*

Increasingly digital technologies also enable the delivery of goods as well as services. Instinctively these goods will be thought of as digital products, software, apps, etc. that can be deployed via the internet. Turning once again to the example of additive manufacturing, if a UK manufacturer were to use this technology to generate bespoke designs, for digital deployment and delivery through a 3-D printer in a client factory located in China, then our whole idea of what constitutes exports of goods and services is challenged.

International trade, with digital technologies cannot only be an enabler of trade through connectivity, but also act as a mechanism of delivery. This is a topic I covered in a speech at Google HQ in London in November 2017[(8)], where I explored the increasing blurring between trade in goods and services.

**POLICY RECOMMENDATIONS**

The UK needs to place the foundations of industrial strategy: energy, raw materials and trade, at the centre of policy. It will be important to UK sovereign capability, particularly in a post-EU situation, that the issue of energy be addressed, to enable the economic reshoring of parts of the metals and materials supply chain, to enable the innovation that will transform our economy through the 4th industrial revolution.

Innovation has an important role to play. Crucially it is innovation that can help ensure that that Britain is both competitive on energy and low carbon. Investment by government in new technologies, such as enabling the hydrogen economy, could deliver this result.

We must also wake up to the need to protect our market access, relying as it does on historical and global trading infrastructure and to ensure that our foreign and industrial policy does not allow UK competitive advantage in this area to be eroded.

By acting in this way, to achieve the twin goals of environmental sustainability and protection of our sovereign capability in industry in trade, we will also establish the foundations for an economy that delivers both prosperity and equality.

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