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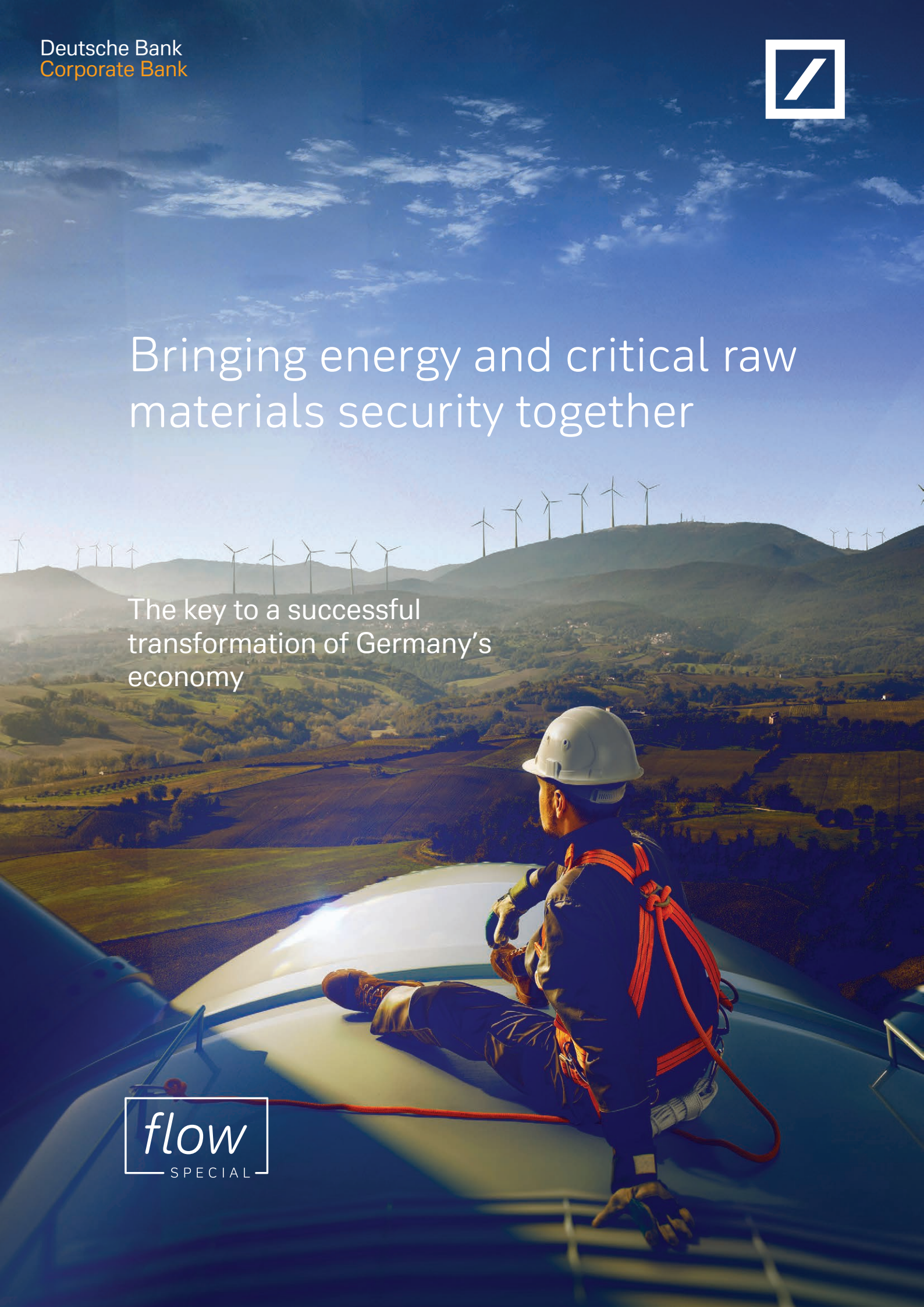
Bringing energy and critical raw materials security together

The key to a successful transformation of Germany's economy



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SPECIAL

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This *flow* special report has been prepared by Deutsche Bank in cooperation with expert advisers from the corporate and consulting sectors

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As of July 2023

Introduction

A stable supply of energy and raw materials contributes to the prosperity, economic growth and competitiveness of Germany and, for this reason, is vital for German industry. Industrial companies depend on low-cost and internationally competitive energy supplies. In the past, this has been achieved mainly with gas supplies, easily accessible lignite and oil. The sharp rise in energy costs is an ever-increasing burden on the profitability of energy-intensive industries. Passing on price increases is only partly possible or with delay. Due to the reduced cash flow, some companies are temporarily postponing strategically important transformation investments. Since many of these companies are under continuous pressure to invest in future proofing their businesses, a sustainable energy policy would help them address this challenge.

In our white paper Commodities security in a volatile world[1] we have already examined dependencies relating to non-energy raw materials and developed first approaches to solutions. This white paper adds energy to the review and introduces further reflections on raw materials procurement. The three themes were developed in cooperation with Deutsche Bank's "Beiräte", expert advisors from the corporate and consulting sectors.

The dialogue with this Advisory Committee helps us to understand the impact of energy security and raw materials procurement for companies and the ways in which we as Deutsche Bank can provide support.

Theme 1: Transforming the German economy requires rethinking its sourcing strategy for energy and raw materials

Theme 2: Without commodities security there can be no energy transition. Without energy security, there is no transformation of raw material procurement

Theme 3: Transformation calls for realism and compromise on the goals of sustainability, resilience, and competitiveness

Note: This *flow* special white paper is an English translation of the results special paper, Energie- und Rohstoffsicherheit in Einklang bringen[2] first published in German (July 2023). Some of the sources are therefore referring to German language publications

Theme 1:
Transforming the German economy requires rethinking its sourcing strategy for energy and raw materials

Market volatility and the sustained high energy prices in Europe present a competitive disadvantage for Germany. When this is combined with dependence on only a few suppliers of key raw materials, the transformation of the German economy is threatened. Although current commodities prices are some way off the record highs of mid-2022, it is safe to assume that energy remains more expensive in Germany long-term than it does in the rest of the world. If Germany's industry is unable to go down the path of sustainable and digital transformation on time, de-industrialisation could be the consequence. Despite these challenges of implementing the transformation, Germany and Europe have a once-in-a-century opportunity. The continued use of fossil-based energy is continually called into question and the development of renewable alternatives is accelerating. This very comprehensive energy transition provides the opportunity to learn from current mistakes and identify a stable model for the future free from the uncomfortable dependencies in place at the moment.

An update of the German energy and raw materials sourcing strategy is urgently needed. The sourcing of raw materials from reliable partner countries, as well as the expansion of local production capacities, should play a key role in this. Such an approach is vital for the supply of energy sources such as renewables or green hydrogen. The benefits are clear – a healthy mix of diversification and local production increases the resilience of the supply chain, thus mitigating supply chain interruptions and related pricing shocks.

That would be a completely new approach. Current supply chain logic is based mainly on cost considerations. In other words, if you are a supplier of a defined consignment of goods (quality, size, etc.) at the lowest price you will usually be awarded the contract. This has led to concentration of country risk over the past few decades. To strengthen supply chains going forward, there needs to be much greater consideration of price security and ongoing availability.

What is being done towards this goal? One example of a regional response to the issue of raw materials supply security is the European Commission's proposal under the Critical Raw Materials Act, presented on 16 March 2023, to establish a supply limit for strategic raw materials.[3] For example, no more than 65% of the EU's annual consumption of a given raw material can come from a single third country (outside the EU). Other approaches include a region's own extraction, additional processing and recyclability of raw materials. The aim is to increase recycling capacity in the EU to cover at least 15% of the annual EU consumption of strategic raw materials.

Theme 2:
Without commodities security there is no energy transition. Without energy security, there is no transformation of raw material procurement

a) Focus on commodities security

Since the 1970s, Germany and many other advanced economies have followed a common approach: They have focused on shifting value-added activities from the secondary (manufactured) to the tertiary (service) sector. As a result, certain metals-based inputs for the end products produced in Europe are often imported.

This development has left Germany and its European neighbours currently exposed to significant risks in raw material procurement. Risks and challenges lie in both the extraction and processing of raw materials, as is particularly evident from the example of rare earth metals (REMs). China dominates the global supply of these[4], but Brazil and Vietnam also have a number of deposits. However, these two countries together only amount to around 1.5% of Chinese production[5]. Developing the know-how and the costs of REM processing are a challenge. About 80% of all new patent applications are for rare earth technologies and 90% of them are for further processing and are from China.[6] Europe has only one processing plant operated in Estonia by a Canadian company[7].

In addition to this, there are two key trends that make it imperative for Europe to rethink its policies on raw materials procurement:

1) The COVID-19 pandemic and the deterioration of the geopolitical environment following the Russia-Ukraine war have led to a destabilisation of global supply chains. The reliability of international trade, which was taken for granted only a few years ago, has been severely damaged.

2) For some consumers, sustainability track record is becoming an increasingly important factor in their purchasing decisions, and this is having an impact of the value chain upstream. Furthermore, national and European supply chain legislation will have a significant impact on how and from which countries raw materials can be obtained.

The dependency of German businesses on raw materials imports and fully functioning supply chains are already felt in daily business operations. Research (as at April 2023[8]) indicates that 39% of manufacturing companies have their production outputs reduced because of difficulties accessing inputs. While shortages of raw materials are not new to these manufacturers given the cyclical nature of economic and commodities cycles, the scale of the problem is yet unknown.[9]

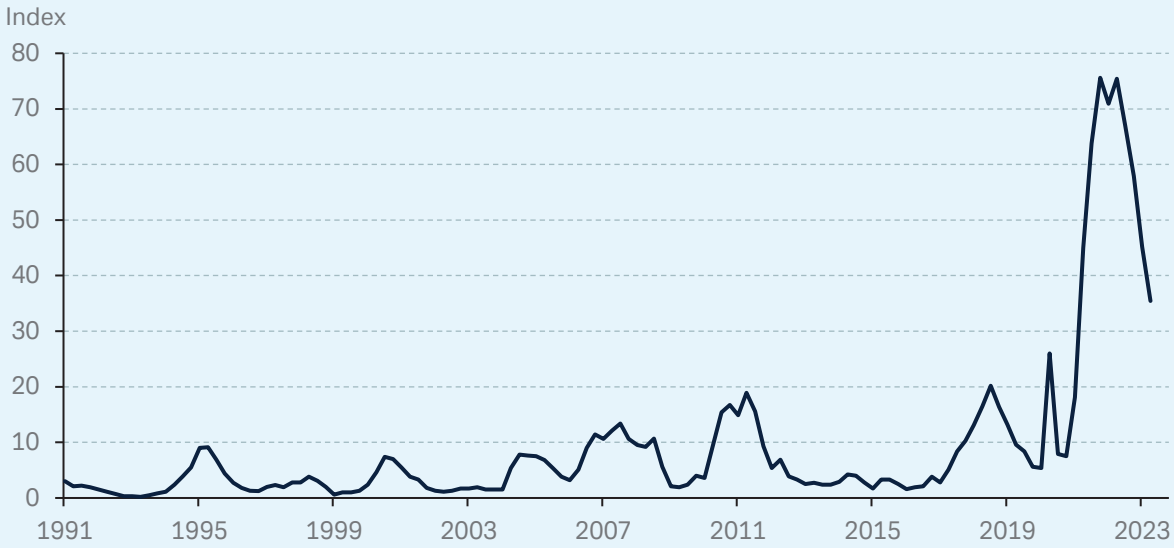

Figure 1: ifo scarcity indicator for manufacturing companies
Source: ifo business cycle surveys

To reduce these supply chain risks for individual companies, strengthen the resilience of German supply chains, and reduce Germany's competitive disadvantage because of expensive raw material imports, the following approaches could play a significant role:

1) Diversification of German primary and secondary raw material procurement through investment in mining projects/refineries/processing capacity and the development of new strategic multinational partnerships.

2) Improving resource efficiency and the circular economy.

3) The setting up of a strategic back-up system in the event of short-term shocks.

For a vertically integrated supply value chain (such as extraction, processing, deployment and then recycling), to be viable and profitable, certain risks need to be minimised. At the outset, local/domestic raw materials extraction would increase costs. Taking copper as an example, experts have calculated that it would cost twice as much to extract and refine copper in Europe through a vertically integrated process than importing it from China. A proportion of these additional costs could be absorbed by consumers with the other part remaining with the producers.

In addition to managing these increased costs, if Germany and the EU are going to complete more raw materials projects, there are three key risks to be addressed:

1) Licensing and acceptance. It can take around ten years to obtain final approval for a raw materials extraction project. In addition to the duration of licensing procedures social acceptance of a raw material project given the environmental impact on a region also poses a risk. While the authorisation time would need to be accelerated, this cannot be done at the expense of local community consultation. A central point of coordination of all raw materials

projects could bring these processes together, pool expertise and provide on-the-ground intelligence.

2) Technical risk (or performance risk). Financing commodities projects is based in part on calculated values of the quantity and concentration of raw materials to be extracted. If these assessments are inaccurate, they can lead to lower cash flows and, ultimately, funding gaps.

3) Price and general purchasing risks. Similar to the issue of calculating production volumes, the final sales and applicable price determine the profitability analysis of a raw material project. Although long-term purchase contracts offer the producer some certainty in terms of planning, they can put the buyer at a competitive disadvantage when prices fall. Without the outlook for long-term contracts, however, only a few projects will be developed. In order to achieve market equilibrium certain incentives for long-term contracts, such as price guarantees through so-called contracts for difference or tax incentives for the customer, could be effective.

However, it is not enough to just secure access to the raw materials. To make a real contribution to strategic raw materials autonomy, capacity and competencies in raw material processing must also be retained or rebuilt.

This circles back to the focus on energy supply: Raw material processing can only be economically viable if the energy costs are based on international comparative prices. For approaches to a permanently lower level of energy prices, see the chapter ‘Competitively priced energy security’ on page 14.

International trade partnerships

In addition to rebuilding domestic mining and processing capacities, international trade partnerships play an equally important role. Which countries are potential partners for diversification of raw materials? An analysis of the main producers of the 30 raw materials that the European Union considers critical is a helpful indicator.

Country	Number of critical commodities*	Political stability (0-100)[10]	Energy availability (in TJ/GDP in US$m)**, [11, 12]	Transport infrastructure (0-100)[13]
Canada	6	80.2	6.2	65.7
Australia	6	74.1	3.5	60.8
USA	6	47.6	3.8	79.6
Japan	5	86.3	3.4	87.8
South Africa	5	21.7	12.5	58.7
Kazakhstan	4	37.7	13.9	48.7
Chile	3	48.6	5.0	56.6

Figure 2: Overview of countries eligible for potential commodities partnerships

Source: Deutsche Bank. Given the current dependence on China and Russia, the capacity of these countries is not included in the overview.

The countries listed in Figure 2 are among the largest producers of raw materials such as lithium, rare earth metals, titanium, cobalt, indium, vanadium, germanium and many others. A long-term partnership with the countries listed here could thus make a strong contribution to ensuring reliable supplies. Bilateral raw materials partnerships or research cooperation (Peru and Mongolia) already exist or are being prepared (Australia and Canada). The potential of a raw materials partnership with Canada has been recognised by the EU and in 2021, a Commodities Agreement was concluded to address trade and investment in raw material value chain.[14]

* The number of critical raw materials in which each country is one of the top five raw materials promoters. Data is provided by the US Geological Survey[15]

** Energy production in 2021 divided by GDP in 2021 in US$m

The circular economy

In addition to local extraction and multinational partnerships, the circular economy plays an important additional role. As explained in our paper *Commodities security in a volatile world* (see Note 1), recycling starts with modular product design and should always be planned in when developing new technologies. Increasing recycling rates not only saves resources but also makes an important contribution to increasing raw material security, alongside the development of production and processing capacities. With growing demand for raw materials within the EU, and thus larger volumes of them in the European economy, local recycling can further reduce import dependency. To use this 'urban mine', products at the end of their life cycle must be recycled locally – instead of being exported as it is often the case today. The EU has a fairly high recycling input rate (RIR) for selected critical raw materials, which underlines the EU's ambition. Note that the RIR comprises the percentage of total raw material demand that can be met by secondary (recycled) materials. Take copper, for example. Here the EU can cover 55% of total demand for copper from secondary raw materials. However, other critical raw materials still have some catching up to do. As many as 22 of the materials classified as critical raw materials still have a recycling input rate of 3% or less.[16]

Recycling processes are becoming increasingly complicated. This is due to factors such as the complexity of product design and the variety of materials used in technological products. The recycling of components made from microchips or car batteries is far more complicated than the recycling of, say, steel. For efficient utilisation, a large-scale infrastructure needs to be further developed in both the corporate and private sectors. As part of its commitment to climate neutrality by 2050, the EU is accelerating the circular economy and taking a global leadership position with its commitments. Examples of this include the *Circular Economy Action Plan*[17], regulations on packaging design and a "right to repair", which is to be proposed in a legislative text in 2023. While recycling transforms waste into new products or raw materials, there is still the possibility of re-use without recycling. The construction industry serves as a useful analogy of how to extend the life of materials by finding new uses for them. For example, before the demolition of a building, valuable components are removed for repurposing, thus saving resources and energy.

Furthermore, commodities partnerships can also be deployed for trade not only in raw materials such as metals ores, but for the import of valuable scrap or reusable inputs at the end of their life cycles. This increases the amount of valuable material that is returned to the EU's economic cycle.

Physical reserves

The third approach to increase resilience and cushion temporary supply disruptions is the development of a physical commodities reserve. This would mean stockpiling critical precious and industrial metals, including REMs and alloys. In this next section we outline a possible approach to ensure access to critical raw materials through such strategic stockpiling.

Country	Raw materials	Operation/ ownership	Control	Purchase	Financing
	Oil, gas, metals and minerals	State	State	State	Budget of the US Department of Energy
	Oil, gas, metals and minerals	State entities, private sector	State, private sector	State and private sector for oil and gas, public and private partnerships for metals and minerals	Public funds, Loans from JOGMEC (Japan Organization for Metals and Energy Security Authority)
	Oil, gas	Oil and gas exploration companies and traders	State	Oil and gas exploration companies and traders	Surcharges added to costs

Figure 3: Existing commodities stockholding systems
Source: Deutsche Bank, based on state guarantee and private sector stockholding investment data

For Germany, a two-track strategic commodities reserve system could be put in place:

1) A government reserve could be controlled by the Federal Government and be owned by a public institution. This reserve is a 'metals supplier of last resort' for serious emergencies (e.g. war, macroeconomic risks) to meet the basic needs of the population and economy over a period to be defined.

   (i) Organisational set-up:
   A state agency with a strategic mandate for specific crisis situations where that agency can identify systemically important raw materials in close consultation with industry and then create a commodities reserve. The state strategic reserve is primarily used to bridge physical supply shortfalls in crisis scenarios where a private strategic reserve could not be sufficient.

   (ii) Definition of raw materials:
   An analysis could be built, based on the EU's list of critical raw materials and then validated for practical application with the German industry. When selecting the raw materials for inclusion, simulations of crisis scenarios – along with the arising needs – should be run to test their impact.

   (iii) Managing the purchase and construction of the strategic reserve:
   To build the reserve, a central legal entity could enter into purchase contracts with private commodity traders to purchase an agreed amount of raw materials over a period of time.

   (iv) Release process according to pre-defined trigger events:
   To conclude, a clear plan should be drawn up, along the lines of Germany's Gas Emergency Plan, outlining when the raw materials should be made available.

2) Germany's Federal Government should support and encourage privately run reserves. It can do this, for example by:

   (i) reducing (or abolishing) the import sales tax for procurement; or

   (ii) allowing a deduction in value for imported goods that are subject to fluctuating world market prices. This could help to reduce the risk of stock value declines in international trade markets.

The preliminary ideas for the design and financing of such a reserve are set out in the Appendix (Figure 8). In essence, it is a question of interested industrial companies being able to purchase extraction rights to specific raw materials from the legally appointed partnership coordinating the reserve.

b) Focus on energy security

The current geopolitical environment has demonstrated that the energy discussion should consider the entire scope of primary energy procurement. Primary energy demand is divided between different consumer groups (industry, households, transport and the service sector) and, within the consumer sector, between different types of use (heat, electricity, mobility or mechanical energy). Consider heating. With a 57% share, the heating market is the largest of the end-use energy sectors.[18] Consumers are mainly private households (heating) and industry (process heating). Currently, heating in Germany is produced mainly from natural gas and mineral oil.

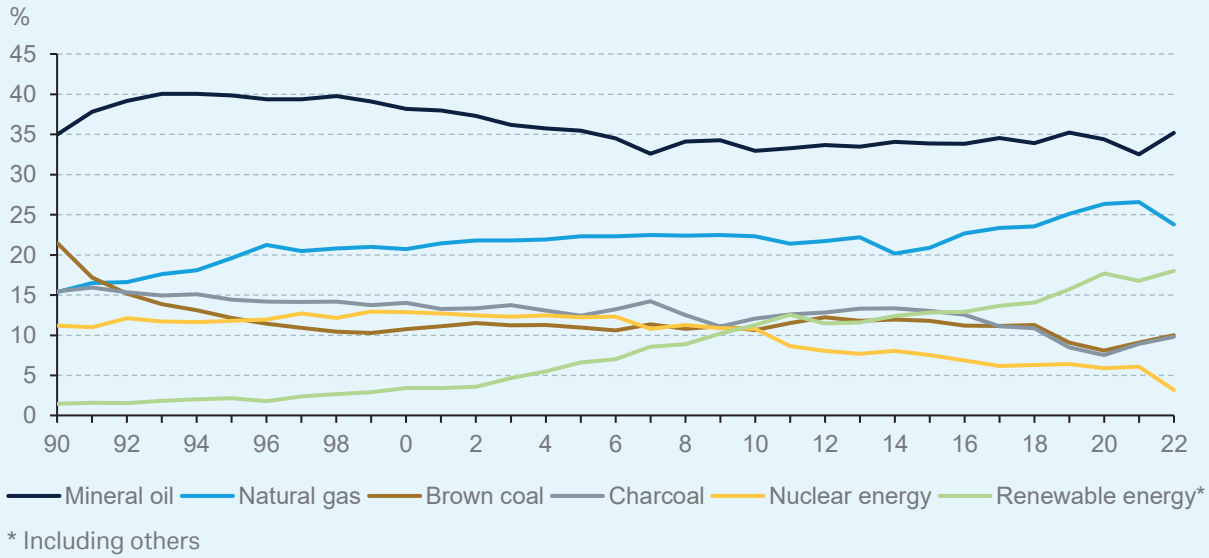

Figure 4: Composition of German primary energy consumption
Source: AG Energiebilanzen, BMWK (Federal Ministry for Economic Affairs and Climate Action)

From Figure 4 above, it can be seen that mineral oil and natural gas are key components of Germany's energy security. At the same time, these sources of energy nearly all come from abroad.

In 2021, import quotas for mineral oil were around 98% and for natural gas around 95%.[19] In total, only 29% of Germany's primary energy consumption is derived from domestic sources; According to the Federal Office for the Environment, the production of energy raw materials in Germany has fallen by 43% since 1990. This relates, in particular, to coal and lignite and the production of natural gas.[20] In energy procurement, greater diversification and cooperation with reliable partner countries is also essential.

It's not just about the availability of the energy sources, but also the assurance of long-term stable prices to enable the sustainable and digital transformation of Germany's economy. In the context of the energy crisis and the associated price increases, the public debate on energy procurement and the energy transition has gained a whole new momentum. Since the beginning of the Russian invasion of Ukraine in February 2022, prices have soared, including those of gas and electricity.

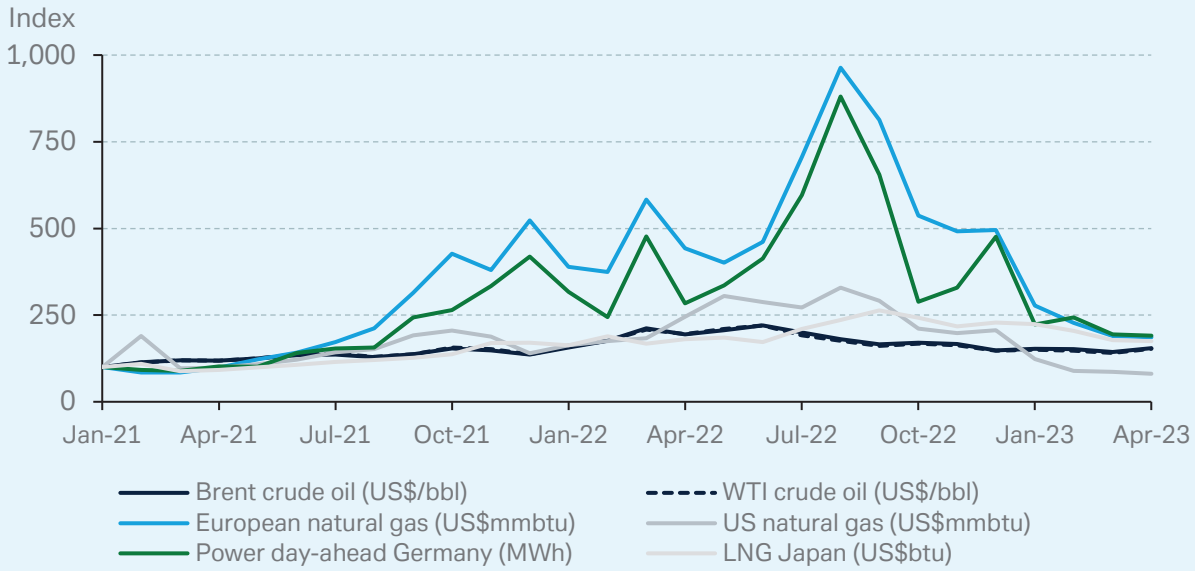

Figure 5: Global producer prices (January 2021 = 100)
Source: Weltbank and Bundesnetzagentur

One threat to Germany's economic position lies in the risk of 'investment leakage', i.e. that new investments in energy-intensive projects will be transferred to locations with lower energy prices. The higher level of energy prices in Germany (and Europe) by international comparison is summarised in Figure 5. For example, while gas prices in Europe peaked in August 2022 and almost increased ten-fold compared to January 2021, the price increase was significantly lower in other major economies such as the US and Japan. Given that Germany has an interest in keeping its processing industries local from a geopolitical perspective (for example, to process metals for the energy transition) the energy policy conditions should not urge companies to relocate their production. In other words, security of energy and of raw materials are very closely linked.

Competitively priced energy security

How, then, can Germany retain energy security (both availability and competitive prices) and at the same time reduce its dependence on fossil fuels?

The need for lower prices to maintain competitiveness has become an increasingly popular discussion topic in Germany which can be seen in the debate around a dedicated electricity price for the energy-intensive companies ('Industriestrompreis').[21] Such a market intervention (in effect, a subsidy) would benefit a selected number of customers, such as those in energy-intensive industries. Criteria could include the need for a particular industry's transformation. Given the very different price points around the world, such a solution may be useful in the short to medium term (as a bridge). However, this subsidy must be clearly linked to savings targets (for example, by setting out certain percentages relevant for that industry) or to additional investment. To give such huge subsidies for the largest electricity consumers would also be a burden on public finances. So, this approach should balance short-term excess spending and medium-term losses in wealth – including the macroeconomic impact – against each other. In addition, it should be noted that a loss of the upstream value addition (e.g. steel production) would also inevitably have an impact on the processing parts of the downstream industry (such as car manufacturers) and their ability to innovate. In addition, for the short-term solution of the problem, consideration should be given to the possible suspension of elements that are covered by surcharges and taxes in the energy price. This could include:

(i) the suspension of the existing levies (about 1.3 ct/kWh for industrial customers);

(ii) the abolition of the electricity tax (1.5 ct/kWh + 19% VAT); and

(iii) the assumption of network charges by the State (3 ct/kWh)[22] .

In the long-term, however, the aim must be the provision of low-cost electricity with the development of renewable energy sources. Nor should the necessary infrastructure be neglected here. Among other things, more emphasis should be placed on innovation in storage technology so that the development of renewable energy inputs can be integrated into a flexible network system. Otherwise, the price of electricity will remain dependent on the gas-centred merit order principle (where sources of power generation deliver power to the grid by ranking them in ascending order of price together with the amount of electricity generated). This will result in prices remaining high.

The development of renewable energy should, however, be considered not only at German country level but also at European bloc level. Current renewable electricity generation in the EU comes from three main sources:

(i) wind (37.5%);

(ii) hydro (32.1%); and

(iii) solar (15.1%)[23].

Production and potential differ greatly from region to region. The Nordic countries have the greatest potential in terms of wind and hydro power, while southern states can benefit from the extension of photovoltaic systems because of their comparatively higher number of hours of sunshine.

However, the successful development of renewable energy is not just about new wind, hydropower and photovoltaic systems. To make electricity available where it is needed, the development of the European network infrastructure must be moved forward. Although the German electricity network is already connected to neighbouring countries, further investment will be necessary. The degree of interconnection for electricity generation (i.e. the percentage of generation capacity that can be fed into the European grid) varies considerably. A first step towards achieving this interconnection capacity will be to equip national electricity grids with the means to cope with increased flows, particularly in transit countries. But even within Germany, the transport of cheap wind power from the producing north to the consuming south has, so far, been inadequate. The federal government's plans for expansion are ambitious, but it remains to be seen whether the expansion can be implemented at the planned speed. There are still obstacles to overcome. The expansion would have to keep pace with the increasing electricity consumption and a base load of the network would have to be guaranteed at all times, even at times of lower feed-in.

The long-term use of electrical energy, for example in the supply of heat for the private sector, is in transition with increased electric heat pump installations in new buildings having achieved good progress in recent years. Heat generation with electric energy in an industrial context (power-to-heat) can be used in the short to medium term depending on the process, also in the (extreme) high-temperature range. The potential for transition is significant here but in the meantime more research and investment is needed to upgrade existing plants.

As for smelting, the complete substitution of natural gas will be difficult to achieve as certain (mainly chemical) processes require raw materials that contain carbon. Synthetic fuels can only replace them in the medium to long-term. Green hydrogen can make an additional contribution here. This requires import contracts with countries outside the EU that already have a high renewable energy capacity for its production (it uses a lot of energy). Potential suppliers are located in the Middle East, North Africa, Latin America and Australia. Here, too, a balance between local production and diversified sourcing is key. One thing is clear: Germany will only be able to produce a small proportion of the required green hydrogen at home and will therefore have to meet its needs largely from imports.

The changing energy mix – scenarios

How could German's energy mix look in the future? Based on data from the International Energy Agency and on its own assumptions, the World Energy Council Germany has developed two scenarios for a future primary energy mix.

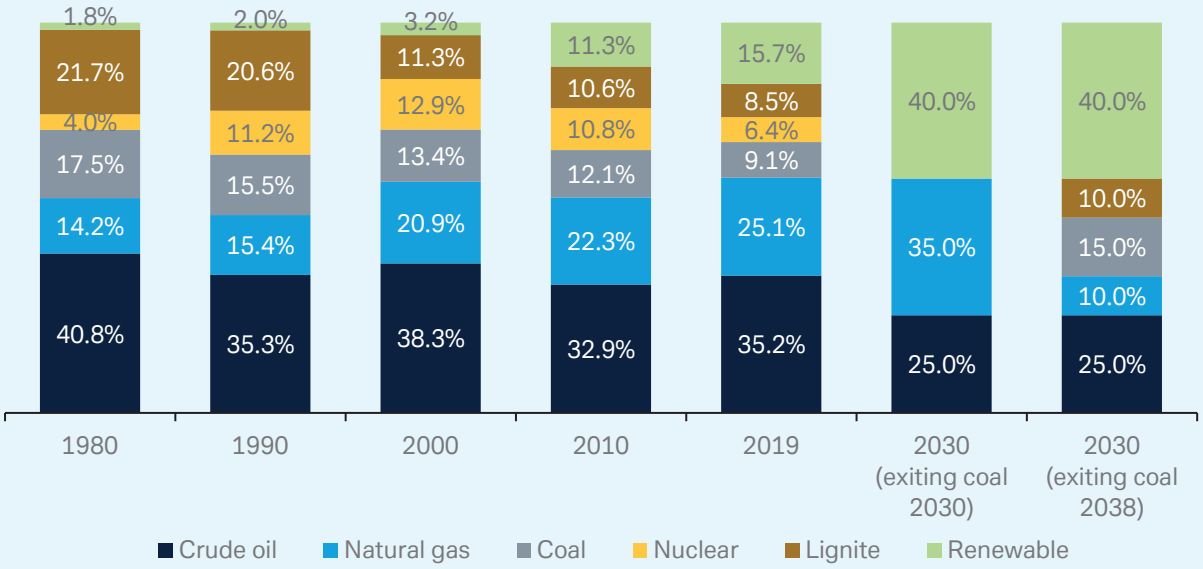

Figure 6: Germany's primary energy mix 1980–2019 including projections for 2030
Source: Weltenergierat Deutschland (World Energy Council Germany)[24]

As shown in Figure 6, a substantial part of Germany's energy mix will continue to come from fossil fuel sources up to 2030. To achieve carbon dioxide (CO_2) -neutral production processes, CO_2-neutral technologies such as Carbon Capture Utilization and Storage (CCUS) could serve as a bridge technology. This is already being used in a number of countries and aims to capture and store CO_2. For a broad introduction of CCUS however, significant investment and technological progress are needed, and social and political barriers would need to be overcome. The costs of capture and transport of CO_2 can be high, but one could anticipate that these costs would reduce over time with improved technology.

Overall and in conclusion, energy transition in Germany has many starting points when all aspects of energy demand are examined and the issue of electricity usage examined from the entire primary energy mix – particularly in the heating market.

Theme 3:

Transformation demands realism and compromise on the goals of sustainability, resilience and competitiveness

The collective interest in bringing sustainability into all aspects of daily live and the real economy is mainly grounded in energy policy.

However, raw materials policy is now receiving increased public attention due to recent geopolitical events having led to an awareness of security of supplies. Some of the assumptions made regarding the availability of energy and critical metals have turned out to be incorrect. The focus on cost-effectiveness is incompatible with maintaining security of supply and reduced environmental impact.

The energy triangle covers the priorities of security of supply, cost-effectiveness and environmental sustainability. But the core problem with a triangle of goals is that there are trade-offs, and thus achieving the goals requires a certain degree of compromise. Decisions in favour of resilience can negatively affect competitiveness or sustainability. The challenge is to assess each goal and prioritise without neglecting the other goals.

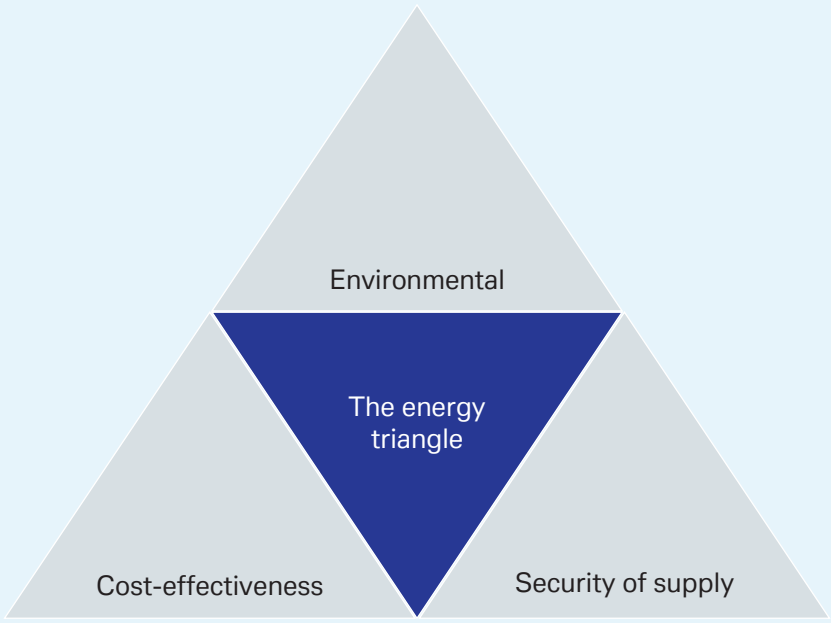

Figure 7: The energy triangle
Source: Deutsche Bank

It should be noted that not every decision in favour of, say, security of supply, automatically means a diminution of the other two aspects. Security of energy and raw materials must be considered

in a global context. In this way, increasing or supporting local procurement also means that local attention is focused on managing the environmental impact closer to home and thus avoiding a potentially negative impact elsewhere. Improved technology and sustainable innovations could increase resilience and security of energy and raw material supplies – albeit at additional cost. While diversification of supply chains incurs additional cost in times of crisis, it reduces concentration risk by mitigating prices shocks and helps maintain competitiveness.

Role of the state

One question remains: What is the role of the state in optimising the energy triangle?

It is in the energy and raw materials sectors that the state plays an important role. On the one hand, government intervention can help ensure a more stable, reliable and sustainable development of energy systems and secure access to the raw materials needed for economic growth. On the other hand, too much state intervention can create inefficiencies, market distortions and less innovation. To find the right balance, the following points should be taken into account:

- Market forces: These should play a primary role in determining the distribution of resources and prices, as this promotes competition which leads to innovation and market efficiency.
- Regulation: To promote environmental sustainability, security of supply and the development of new technologies, certain aspects of the energy and raw materials sector need to be regulated.
- Investments: To encourage the development of new technologies and industries, incentives for investment are needed. With leaner authorisation procedures and more risk sharing with the state, especially in the initial phase of projects where private investors are usually hesitant, much more private capital can be mobilised. A good example of this is the planned "Growth Opportunities Act"[25], which is intended to complement the promotion of investments in sustainability with investment premiums. These may include, for example, assets from the areas of energy and resource efficiency.
- International cooperation: We need government partnerships to create a stable and secure global energy and commodities markets.

Conclusion

In the context of the energy transition and a redesigned raw materials procurement strategy, Germany needs - and has the potential to design - a stable model that dramatically reduces current strategic dependencies. The focus of the EU and Germany, with a strong industry, can be based both on diversified value chains and on greater sustainable vertical integration, from raw materials through to intermediate products and then to finished products.

The objective of commodities security is most likely to be achieved as a result of diversifying sourcing countries, increasing the local production and processing of raw materials in Europe, and in implementing circulatory systems. But this is a demanding agenda. Social acceptance is an important factor in implementing commodities projects. Expert estimates suggest that this has rather decreased and is accompanied by a 'not in my backyard' attitude that leads to conflicts of interest between the civilian population and other stakeholders.[26] On the one hand, there is the need for a sustainable transformation of the economy which means having these commodities. On the other hand, the population is critical of the opening of mines, for example, which are needed to source the raw materials at least partly locally. To counter popular rejection, education, civic participation, and benefit sharing will be necessary. The environmental, economic and social benefits; and the disadvantages of local extraction must be openly discussed.[27] Industry, in turn, could evaluate their value chains and focus and communicate more on the availability of raw materials and the resilience of value chains (taking into account sustainability issues).

Price stability and availability play a vital role in energy procurement. Here, too, diversification of procurement countries and cooperation with reliable partner countries are very important. The energy transition makes it possible to reduce the current dependency on the energy sources used. The aim must be to increase resilience and reduce risk concentrations to create a stable price environment in the long-term. This will help to avoid price shocks that unnecessarily burden sustainable and digital transformation.

Discussion and exchanging of ideas are needed to meet expectations of a fair and sustainable energy and raw materials economy. Not only politicians, economic stakeholders, and society, but also the scientific and financial industry must work out the best possible approach in a transparent dialogue. Despite all the different perspectives, there is one single unifying factor: All participants have an inherent interest in access to energy and metallic raw materials, which not only form the basis of our prosperity, but also contribute to our security and are the foundation of Germany's – and indeed the EU's – sustainable transformation.

Appendix: Ideas for the establishment of a strategic reserve

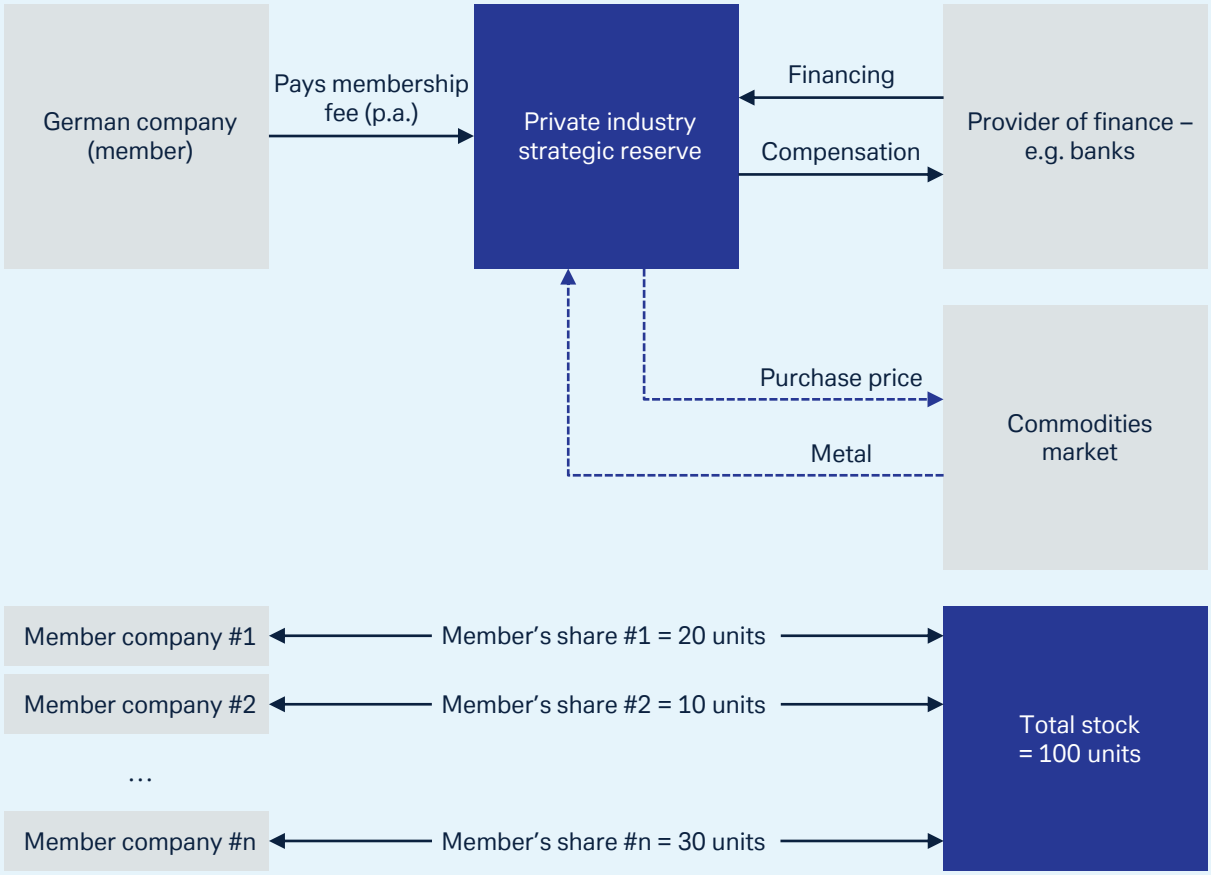

Figure 8: Simplified presentation to explain the pro rata membership structure of strategic reserve
Source: Deutsche Bank

Each participant/member would have the opportunity to lease metals (up to the level of the stockholding entitlement) from the reserve at a fixed rate. This rate should be higher than the average market rate in a normal market environment to maintain the reserve. This leasing approach bridges the time needed to restore the supply and ensure the reserve is maintained at a constant level and in line with the reserve requirements of members. This will ensure that the member (or the reserve agent appointed by the member) restores the reserve and the reserve is thus used as efficiently as possible.

If a member needs more metals than they are entitled to, other members may assign unused rights to the metals lease for its duration (just like a rights issue) via an auction to that member.

To separate credit risk from the structure, a condition of membership should be a minimum level of credit quality or a credit risk mitigation instrument (such as a bank guarantee). This will ensure that the reserve is free from counterparty risk. Otherwise, the credit risk could be significant because leasing contracts like these are concluded on an unsecured basis.

Any German company that requires metals and meets an agreed eligibility criteria (such as ownership structure, business activities, or critical importance to Germany) could become a member of the strategic industrial metallurgical reserve group for an annual contribution. Each member could set an individual stockholding claim for a particular metal, with the Federal Government retaining the right to enforce a minimum stockholding claim for critical industries. The membership fee would be aligned to the value of the inventory assigned in the stockholding claim and would also cover the operating costs of the corresponding institution (for example, the Office of Public Law – Germany's AöR or registered association (e.V in Germany) and payment to the lender.

Financing the raw materials reserve

There could be a number of different financing structures for this sort of institution that could deploy both public funding and private capital:

- The equity should be raised by all members of the reserve in the form of the corresponding annual membership fees.
- A leverage effect could be achieved through bank loans. Capital markets investors could also provide financing through marketable securities structured by banks.

It is important to have a structure that allows transparency and predictability for all parties involved. One of the solutions discussed is the off-balance sheet financing of the raw materials warehouse. Figure 9 suggests a possible financing model. At its core is a company/entity which manages both the purchasing and leasing contracts as well as the financing. It does not matter whether this remains in the hands of the German government or is run by a private sector organisation.

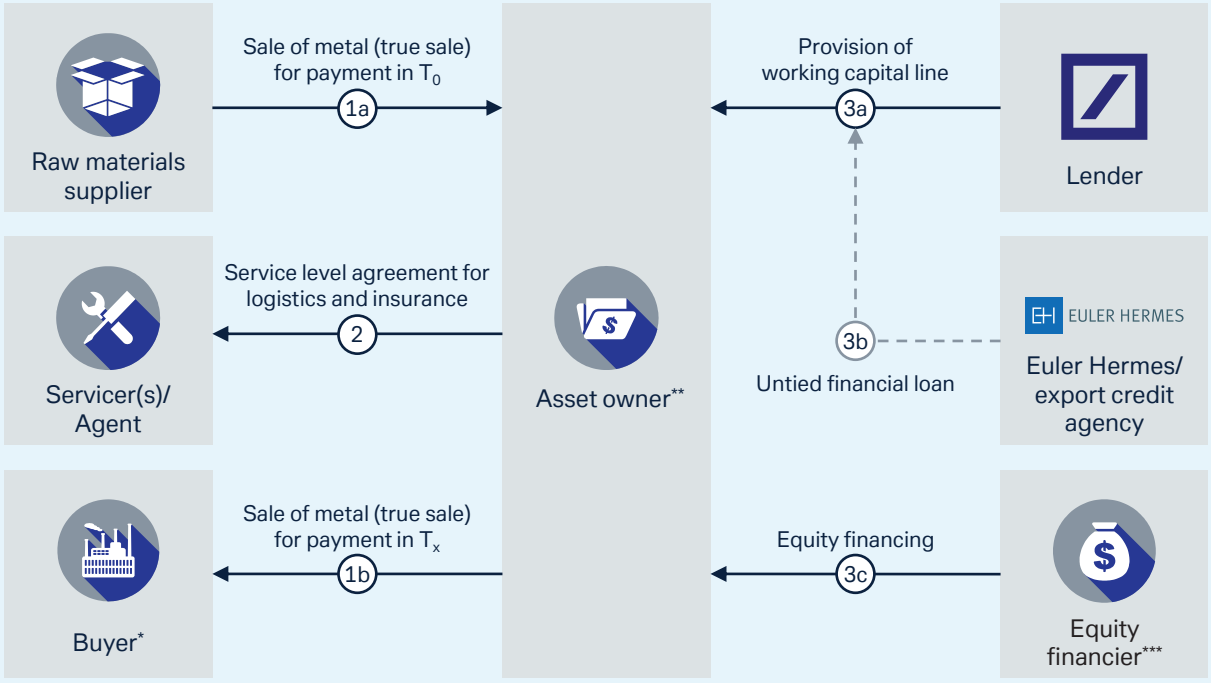

Figure 9: Simplified financing structure of a strategic resource reserve
Source: Deutsche Bank

Sources

1 https://corporates.db.com/publications/White-papers-guides/how-to-ensure-commodities-security-in-a-volatile-world

2 https://www.deutsche-bank.de/ub/lp/energie-und-rohstoffsicherheit-in-einklang-bringen.html

3 https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan/european-critical-raw-materials-act_en

4 See the *flow* article 'Why it's time for a new look at rare earths': https://flow.db.com/trade-finance/why-it-s-time-for-a-new-look-at-rare-earths and *flow* article 'Rare earths – a powerful attraction': https://flow.db.com/trade-finance/rare-earths-a-powerful-attraction

5 See the Results article (in German) at https://www.deutsche-bank.de/ms/results-finanzwissen-fuer-unternehmen/maerkte/07-2022-nicht-so-seltene-erden.html

6 Ibid

7 Ibid

8 As reported by the Federal Statistical Office of Germany at https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Industrie-Verarbeitendes-Gewerbe/materialknappheit-industrieaktivitaet.html

9 Ibid

10 http://info.worldbank.org/governance/wgi/

11 https://www.iea.org/data-and-statistics/data-tools/energy-statistics-data-browser?country=WORLD&fuel=Energy%20supply&indicator=TESbySource

12 https://data.worldbank.org/indicator/NY.GDP.MKTP.CD

13 https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

14 https://www.international.gc.ca/world-monde/international_relations-relations_internationales/can-eu_agreement-accord_can-ue-2022.aspx?lang=eng

15 https://www.usgs.gov/centers/national-minerals-information-center/minerals-yearbook-metals-and-minerals

16 https://single-market-economy.ec.europa.eu/publications/study-critical-raw-materials-eu-2023-final-report_en

17 https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en

18 See https://www.bdew.de/energie/waermemarkt/ (in German)

19 See https://www.umweltbundesamt.de/daten/energie/primaerenergiegewinnung-importe (in German)

20 Ibid

21 https://www.dw.com/en/germany-considers-electricity-price-cap-to-support-industry/a-65531798

22 See https://www.bdew.de/service/daten-und-grafiken/bdew-strompreisanalyse/ (in German)

23 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Renewable_energy_statistics#Share_of_renewable_energy_more_than_doubled_between_2004_and_2021

24 See the World Energy Council's report on Germany for 2022 (in German) https://www.weltenergierat.de/wp-content/uploads/2022/06/Energie-fuer-Deutschland-2022_final-1.pdf

25 https://www.bundesregierung.de/breg-en/issues/sustainability/growth-opportunities-act-2216980

26 Steiger, K., Hilgers, C., Kolb, J. 2022. Herausforderungen bei der Rohstoffversorgung für Deutschland. Eine holistische Betrachtung durch Experteninterviews. Karlsruhe.

27 Ibid

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