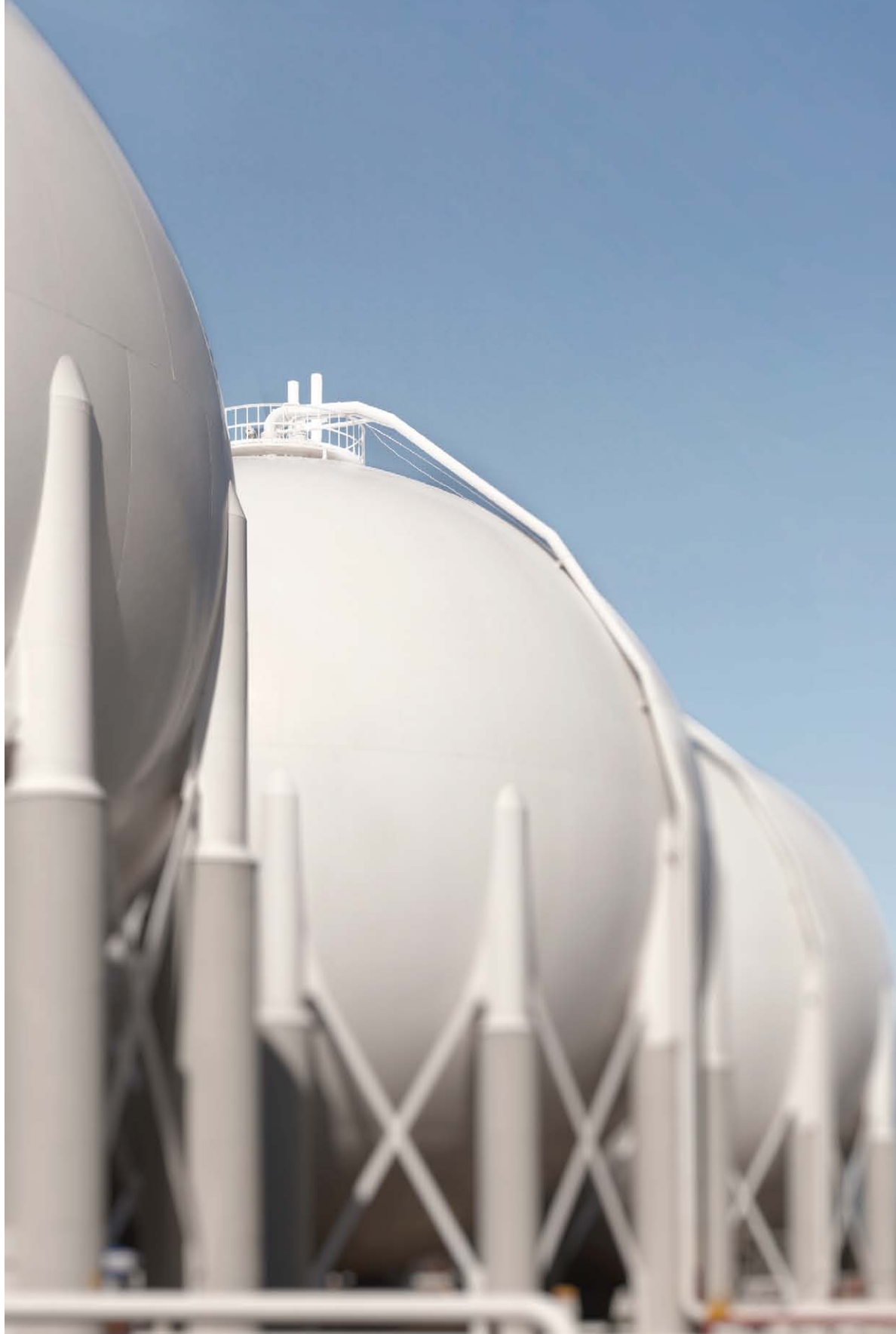


Investors' Insight  
Vontobel Asset Management

VONTOBEL

The smart way of resource investing



# Contents

<b>Summary</b>	<b>3</b>
<b>1. Drivers of resource demand growth</b>	<b>4</b>
1.1 An upwardly mobile developing world	
1.2 Shifting patterns of demand	
<b>2. Outlook for traditional resource companies</b>	<b>6</b>
2.1 Mining	
2.2 Oil and gas	
<b>3. Capturing real growth in the years ahead</b>	<b>8</b>
<b>4. Conclusion</b>	<b>10</b>
<b>5. Case study – specialty-materials companies benefiting from resource scarcity</b>	<b>11</b>
5.1 A high-fibre diet is good for the airline industry	
5.2 Synthetic rubber – riding on the road to success	
<b>Annex</b>	<b>14</b>
Glossary	
About the author	
Sales team contact details	

## Summary

### **The smart way to invest in commodities**

In recent decades many investors have been attracted to funds focused on mining and energy, so as to benefit from the global boom in commodities. But is that still the best approach for the future? We don't think so. In fact, investments in companies specialising in promising segments of the commodities market – such as suppliers to shale gas producers or manufacturers of carbon-fibre composites – offer potentially superior returns in the future. Over the past three years this strategy, which our bank calls “Future Resources”, has already paid off handsomely: investors have enjoyed a return of around forty percent, twice as much as funds investing in mines (21 %) and energy (17 %), according to figures from Morningstar. At the same time the price fluctuations and volatility have been less extreme for the “Future Resources” strategy.

### **The smart way to invest in commodities in the future is therefore to focus on (1) “unconventional” energy companies and (2) providers of advanced technological solutions.**

Will this remain so in future? Very few people would question the fact that demand for commodities will continue to soar. Many emerging-market countries are already reaching an average per-capita income of 6,000 US dollars. This is a level where demand for consumer goods, and ultimately raw materials as well, actually tends to accelerate. This trend is illustrated by a change of thinking in Asia. Governments in this region, especially China, are increasingly focusing their efforts on boosting domestic consumption rather than on infrastructure projects. As a result, demand is also shifting more towards the raw materials required to produce consumer goods. So where is the best place to invest in order to benefit from this trend?

In past decades, rising commodity prices have enabled traditional mining groups such as Rio Tinto as well as oil and gas concerns such as ExxonMobil and Shell to substantially expand their production and sales volumes. These extra funds have been channelled almost on a “one to one” basis into new, increasingly costly exploration projects. According to a study published by Deutsche

Bank, the main beneficiaries of this trend were not the shareholders, as one would expect, but governments and company executives. Even the workers of these companies were able to enjoy a more substantial share of the returns than equity investors. This situation will be amplified in the years ahead as employees gain more negotiating power and there is a trend for resources to be nationalised, or at least for higher tax rates to be charged on extracted resources.

The smart way to invest in commodities in the future is therefore to focus on (1) “unconventional” energy companies and (2) providers of advanced technological solutions.

As far as the first point is concerned: the growing demand for oil and gas is likely to be met almost entirely from what are considered “unconventional” energy sources such as deep-sea drilling, shale-gas reserves and biofuels, as most of the natural resources that are easily accessed have already been exploited. The extraction of conventional resources will at best stagnate or possibly even decrease. Companies specialising in unconventional energy sources – many of them medium-sized concerns and not particularly well-known – will benefit from this trend. These include drilling companies active in the deepwater and the “ultra-deepwater” domains, along with their suppliers and other oil service companies, or oil and gas producers who operate far out to sea. In addition there are also a number of interesting companies working in the fields of biofuels and the liquefaction of natural gas.

The second area includes companies which produce substitute materials for scarce resources, for example. Some of these providers are using enzymes to make products traditionally derived from oil, which could therefore be used as possible substitutes. Others produce carbon-fibre components that enable massive weight reductions in aircraft construction, or produce special tyres that boost a vehicle's fuel efficiency. Many of these companies may be very promising investment candidates for the future.

To summarise: In our opinion the business models of traditional mining as well as oil and gas companies carry inherent weaknesses for investors. At the same time, there are many interesting companies in the area of “Future Resources” which allow investors to “play” the commodities market in the decades ahead. We have a successful approach to investing in “Future Resources” companies and are convinced that this is also the smartest way to invest in commodities in the future.

# 1. Drivers of resource demand growth

It is now a little more than a decade since the current commodity boom began, a period which, despite a blip in the second half of 2008 when prices fell due to worries of global recession, has also been referred to as a super cycle because of the length of time that it has been and is expected to continue. The rapid growth of emerging countries, particularly China, instigated a considerable shift in demand and placed great strains on the availability of resources of all kinds. Previous commodity up-cycles were created by the industrialisation of countries such as Japan and South Korea. However, the countries currently in the process of industrialisation have aggregate population sizes running into the billions. Much of the low cost, easy-to-extract resource deposits have already been exploited since the majority of the developed world began their process of industrialisation more than a century ago.

## 1.1 An upwardly mobile developing world

When per-capita income levels reach a particular tipping point, resource demand starts to accelerate. Goldman Sachs economists estimate that consumption of resources correlates with the proportion of a population with individual incomes above 6,000 US dollars per annum.

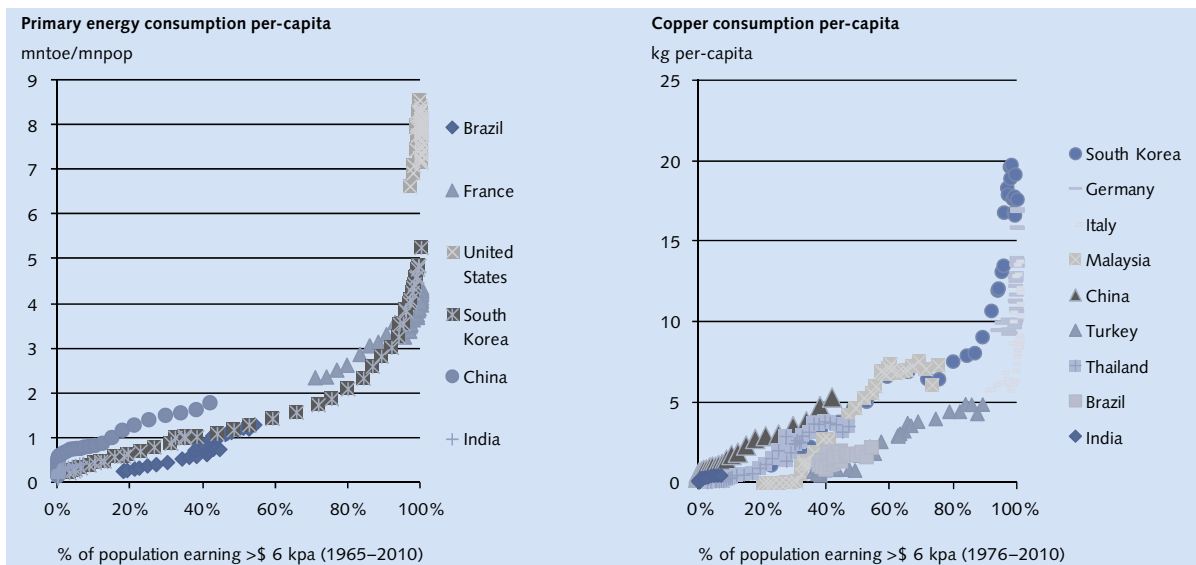
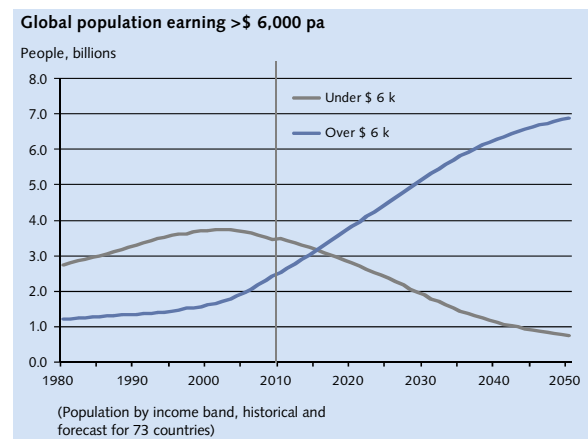
Figure 2 illustrates three charts, the first one of which shows the rapid growth at the beginning of the last decade in the number of people attaining income levels of more than 6,000 US dollars per annum, and the projected significant growth in their number in the coming decades. The second and third charts show historical per-capita energy and copper consumption in selected developed and emerging countries as the proportion of people attaining

this income level of 6,000 US dollars per annum grows as a percentage of the overall population. There is a tendency for per-capita resource consumption to accelerate once this percentage passes over the threshold of 90% of the population. The most recent data points for developing countries such as China and Brazil imply that this percentage has reached only around 40%, leaving plenty of further upside for resource demand growth. India barely registers in the bottom left hand corners of these two charts.

## 1.2 Shifting patterns of demand – the implications of a change of emphasis in Chinese economic growth

The Chinese government has stated clearly in recent months that the focus of economic growth will shift away from fixed-asset investment growth, particularly in the property and some infrastructure sectors, and more

Figure 2: Resource demand growth as per-capita incomes rise

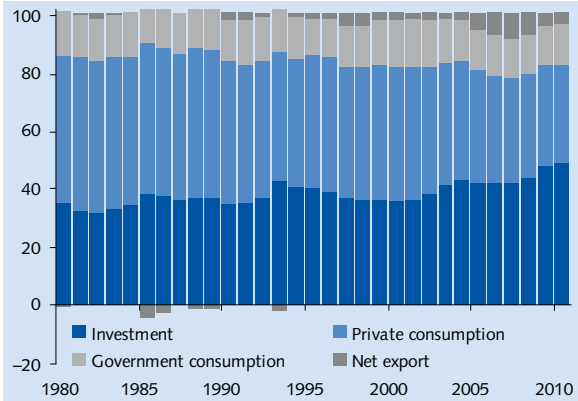


Source: World Bank, CRU, Wood Mackenzie, BP Statistical Review of World Energy, Euromonitor, UN Population Division, Goldman Sachs Global ECS Research

towards consumer-driven growth once again. Figure 3 shows that the consumption share of GDP has declined from 62 % in 2000 to 47 % in 2010, according to statistics from CEIC, an economic research company. Simultaneously the investment share of GDP has risen to almost a half of GDP. The authorities acknowledge that this is not sustainable, as this level of investment could also bring about risks of inefficiency, overcapacity and overheating. A larger share of domestic consumption would also provide more of a buffer from economic crises arising from outside of China.

Such a shift as proposed in the balance of economic growth is positive for the consumption of energy and agricultural products, but less so for mined metals and raw materials which go into fixed assets. The former two sectors are where we place the greater emphasis in the portfolio. In this paper, we will focus on the consumption of energy and the role this topic can play in a portfolio.

Figure 3: Composition of Chinese GDP



Source: CEIC, Barclays Research



## 2. Outlook for traditional resource companies

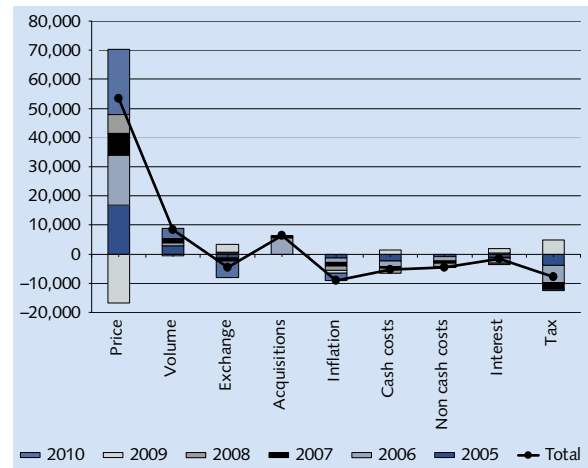
### 2.1 Mining

The group of resource-producing companies that has been the leading beneficiary of this commodity super cycle so far has been the mining sector, driven by the unprecedented level of fixed-asset investment growth in China. Shares in these companies started out at the beginning of the last decade with very low valuations due to a lack of investor interest for a couple of decades. Rising commodity prices have been the overwhelming driver of value creation for these companies, as seen in figure 4. The question is how much value these companies can create without a further rapid rise in commodity prices.

Meanwhile there are rising cost pressures as workers demand a greater proportion of the profits from this commodity cycle, particularly in a time of skills shortages, and costs increase for growth projects – a key factor here being rapidly declining ore grades.

Another insidious threat is that of resource nationalism. Ernst & Young rate it as the greatest business risk facing the mining sector, ahead of skills shortages. They identified 25 countries, highlighted in yellow in figure 5, that have increased or plan to increase taxes or royalties on the industry. These countries represent a significant proportion of overall resource production and it is interesting

Figure 4: Profit drivers for the mining sector 2005–2010



Source: Citigroup

to note that it includes both developed and developing countries. Recent events include Indonesia's plan to impose a 25 % export tax on coal and base metals this year with the rate set to rise to 50 % in 2013. The country also wants to limit foreign ownership of its mines. The government in Australia has finally brought in the 30 % tax on the profits of coal and iron ore mines.

Figure 5: Countries increasing or planning to increase taxes or royalties on miners



Source: Ernst & Young



Looking at the cumulative returns for the different stakeholders in the four largest listed mining companies since 2005 (figure 6), it can be seen that governments are taking the biggest slice of the economic pie available from the companies' endeavours, with shareholders receiving the least. Interestingly, the senior management has earned more than other non-government stakeholders, raising the question of how well aligned their interests were and are with other stakeholders.

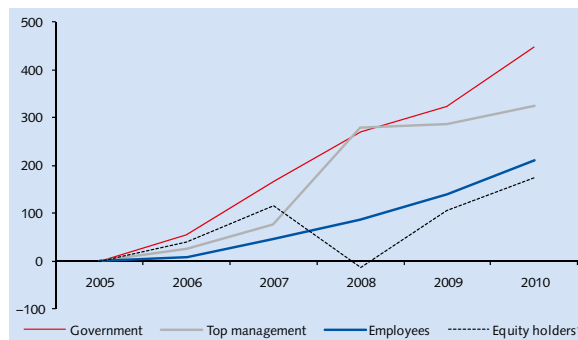
## 2.2 Oil and gas

Resource nationalism also pervades the oil and gas sector. A prime example is that of the Argentinean government seizing control of YPF from the hands of Spanish oil company Repsol – ostensibly because of a lack of investment by it. A cynic, of course, would also point to the vast potential being developed in the Argentina's oil and gas resources held within shale rock.

But the greatest difficulty we see in the traditional major oil and gas companies as appropriate long-term investments is illustrated in figure 7. It depicts how a decade of rising oil prices significantly boosted profits for the sector. Nevertheless, capital-expenditure requirements rose much faster to cope with the need to replace depleting reserves, which together with rising costs, resulted in these companies' aggregate free cash flow remaining broadly unchanged.

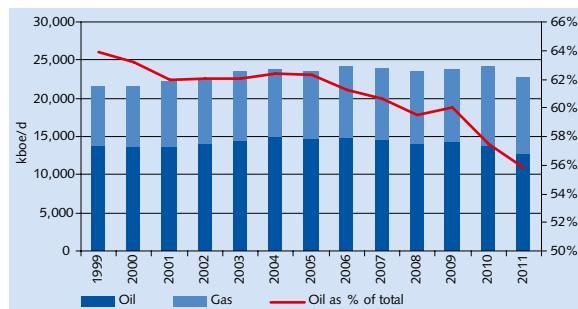
Despite these vast quantities of capital expenditures, production of oil and gas remains broadly unchanged and the percentage of oil, the more valuable resource than gas, has actually declined (figure 8).

**Figure 6: Cumulative returns of the major mining stakeholders above 2005 levels**



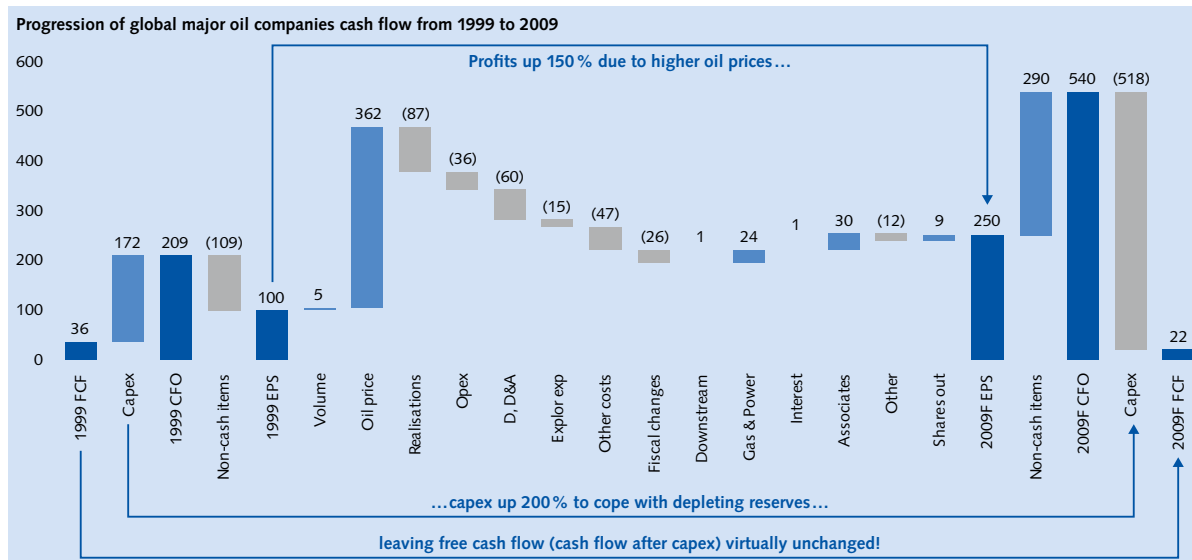
Source: Deutsche Bank, company data, datastream  
\* The equity holder returns represent the returns for AAL, BHP, RIO and XTA

**Figure 8: Global oil majors' oil and gas production**



Source: UBS

**Figure 7: Oil majors' change in profits and free cash flow**



Source: Barclays

### 3. Capturing real growth in the years ahead

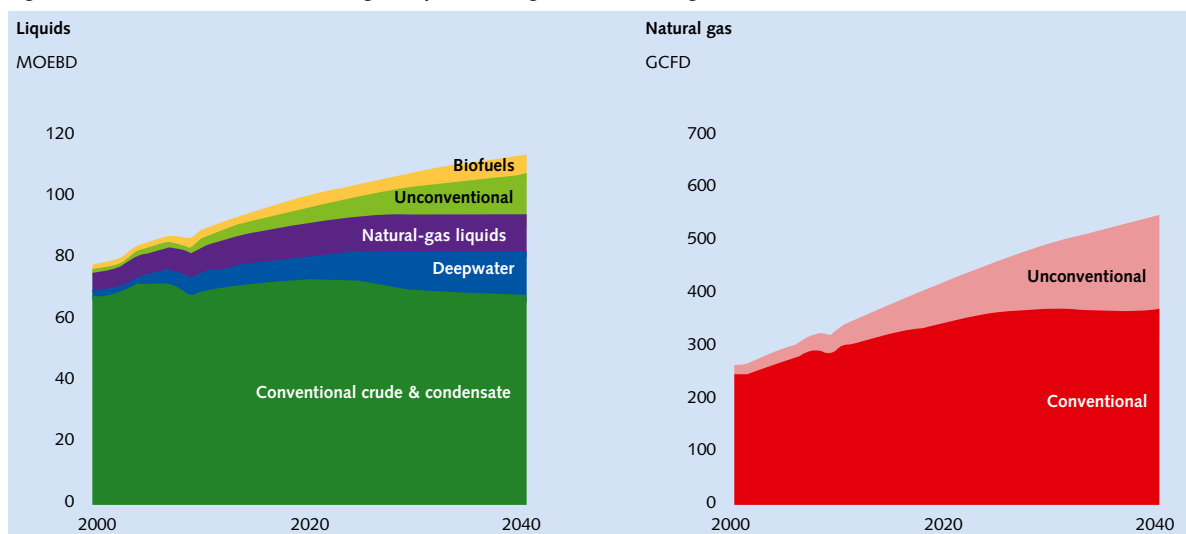
There remains a vast array of investment opportunities to take advantage of resource scarcity and demand growth. These exist amongst companies that can produce substitutes for resources, and just as importantly substitutes for materials made from resources, those companies that manage resource assets in a more effective manner, and those that can improve upon existing extraction technologies, or deliver a better yield.

Looking at the energy sector for example, according to ExxonMobil, the world's largest listed energy company, growth in supplies from traditional (or conventional) sources has come to a halt in the case of oil, and will slow down markedly in the case of natural gas, as depicted in figure 9. The major drivers of production growth are in so-called unconventional. This includes deepwater oil and gas, natural-gas liquids (oily liquids produced in conjunction with natural gas), liquefied natural gas, advanced bio fuels and oil and gas from shale geological formations.

We believe that investing in companies driving technological innovations in these areas will make it possible to gain maximum exposure to these changes. Examples are:

- Deep and ultra-deepwater drilling – *Ensco, Seadrill, Pacific Drilling*
- Offshore drilling rig equipment and technology – *Cameron, National Oilwell Varco*
- Deepwater/pre-salt (below-rock and below-salt layers off the coast of Africa and Brazil) oil and gas production – *Tullow Oil, Anadarko, Cobalt International Energy, Galp Energia*
- Natural-gas liquids/shale-oil production – *Lufkin Industries, Dover Corporation, Nabors Industries, Baker Hughes, Flowserve*
- Advanced bio fuels – *DSM, Novozymes*
- Liquefied natural gas – *BG Group, Chicago Bridge & Iron, Progress Energy Resources, Santos, Ophir Energy*

**Figure 9: Unconventional sources drive global production growth in oil and gas**



Source: ExxonMobil 2012 Outlook for Energy



Often overlooked are companies outside of the energy sector that have blended together chemical, biotechnological and general industrial expertise, and have developed commercial operations that are already making strong financial returns as a consequence of resource scarcity, and without the support of public subsidies. The examples below are by no means exhaustive, but represent some that are of sufficient size and liquidity from an equity perspective to be investable.

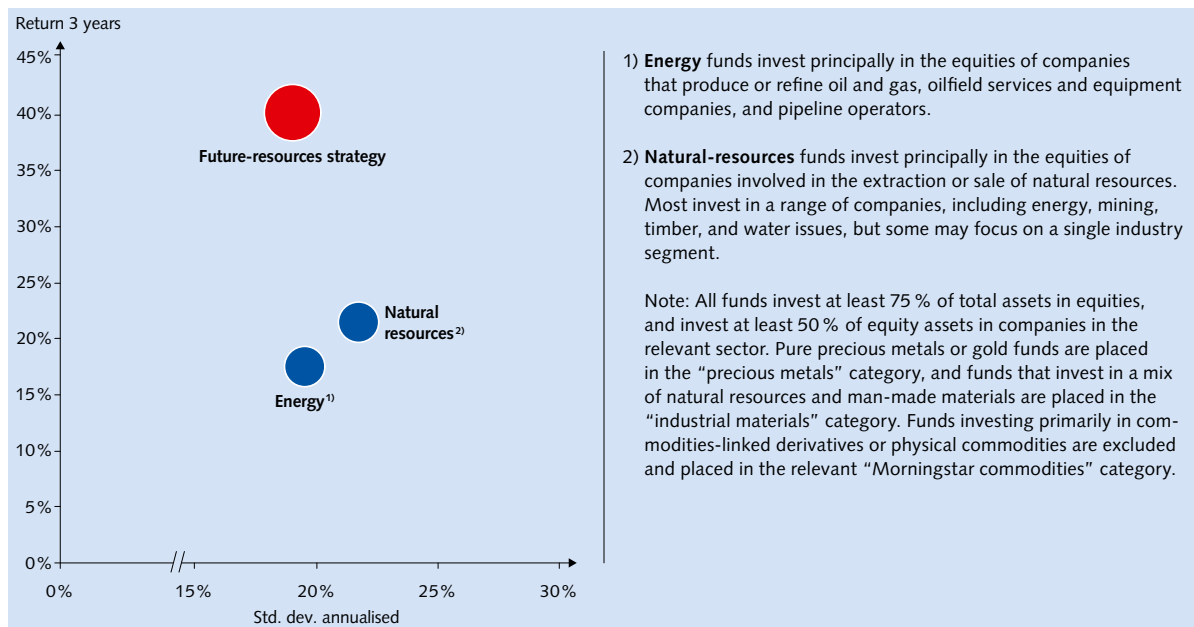
- Substituting for petrochemically-sourced products using other more abundant materials as building blocks – *Novozymes, Croda International, DSM*
- Synthetic materials that can realise fuel savings in areas such as transportation – *Lanxess, Hexcel, Toray, Rockwood, Victrex*
- Catalysts that can convert less economically desirable resources (e.g. heavy, sour crude oil) into products that are much more attractive – *Albemarle, BASF, Umicore*
- Technology that can lower the overall energy requirements of industrial processes – *Celanese, Albemarle, BASF*

- Arbitrage opportunities arising from major price differentials between different energy sources, e.g. the large divergence between global crude oil and North American natural-gas prices gives North American companies that can source raw materials from natural gas instead of oil a competitive advantage over their global peers – *LyondellBasell, BASF, Dow Chemical*

When comparing the risk-return profile over the last three years to 31st May 2012, we can conclude that, investing in companies producing substitutes for resources and materials as well as more efficient resource management – the investment topic we call “future resources” – has paid off.

According to Morningstar data, investing in “future resources” has been more attractive than the aggregate returns from traditional energy and natural-resources-sector strategies.

**Figure 10: Risk-return comparison**



Source: Morningstar

## 4. Conclusion

We believe that

- resources will continue to be an attractive area for investment in the future as per-capita income levels rise in the developing world. We see the biggest opportunity not in the resources companies themselves, but in the companies driving the technological innovations that are enabling change to happen;
- changes in the drivers of economic growth will affect where we see the most opportunity; for example in China, which currently has the biggest influence on global resource demand growth;
- there is opportunity in energy and agriculture while metals and mining are a less attractive area for investment than in the past decade;
- traditional resource-related companies face a number of headwinds such as rising labour costs, higher project costs and increasing resource nationalism, which creates more opportunity for profitable equity investment in companies that can produce substitutes for resources and materials and more efficient resource management.

**“... the energy solutions for the twenty-first century will be found in the minds of people around the world.”**

Most critical of all in our opinion is the need for an investment strategy to include innovation and technology as a core part of the portfolio. Daniel Yergin, the Pulitzer-prize winning author of “The Prize”, a comprehensive history of

the oil industry, sums it up neatly in the concluding chapter of his latest book “The Quest – Energy, Security and the Remaking of the Modern World”:

“... the energy solutions for the twenty-first century will be found in the minds of people around the world. And that resource base is growing ... This will fuel the insights and ingenuity that will find the new solutions.”



### **Investing in Future Resources in a multi-asset class approach**

We consider commodities as a true asset class with unique characteristics in our investment process. Under certain circumstances, notably in an inflationary regime like in the 1970s, commodities are the only effective inflation hedge and indeed in the 1970s they recorded strong absolute gains when equities and bonds suffered a structural bear market. Since the debt crisis broke out in 2008 central banks and policymakers have been intervening massively to counter the deflationary effects of broad deleveraging and prevent a depression. Eventually by intervening again and again the risk of spurring inflation, while not imminent, is certainly increasing.

Since 2002, the price of commodities has been going up significantly, on the back of strong demand from emerg-

ing economies and the difficulty to raise supply significantly. In the first “half” of this bull market, i.e. from 2002 to 2007 mining stocks have been the key beneficiaries. However, since 2007, rising capital spending, spiralling labour costs and resource nationalism has been putting pressure on shareholder’s return of global miners and traditional oil companies. The commodity markets remain an attractive field for investing, but we are convinced that within related equity sectors there are “smarter” ways to benefit as a shareholder.



Christophe Bernard,  
Chief Strategist Vontobel Group

## 5. Case study – specialty-materials companies benefiting from resource scarcity

A major differentiator between our strategy and that of traditional resource equity funds is the inclusion of specialty-materials companies in the investment universe. These companies' expertise in one or more fields of chemical, biotechnological or industrial processes has already led to commercial success with products that solve problems stemming from resource scarcity, without the support of public subsidies.

We illustrate this by looking at two examples in this case study. The first one focuses on the increasing use of carbon-fibre materials in aerospace markets, the second one highlights the opportunities in high-performance synthetic rubbers for the vehicle-tyre market.

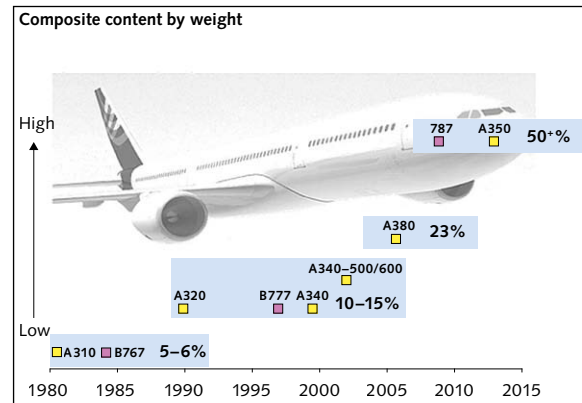
### 5.1 A high-fibre diet is good for the airline industry

One of the sectors worst hit by the considerable rise in oil prices over the last decade has been airlines, as jet fuel constitutes a significant proportion of their operating costs. The drive to reduce fuel consumption is not just a case of targeting better profit margins, but has become a battle for survival.

The use of carbon-fibre materials in the construction of aircraft is a valuable tool in that fight. Carbon fibre and hybrid composites are substituting traditional metals such as aluminium and steel. The light weight of these composites – they have roughly one-half the weight of aluminium and one-quarter the weight of steel – translates into less fuel consumption without making compromises on strength and durability.

The materials have been used in commercial aircraft for a few decades, but their importance has grown in recent years as depicted in figure 11. Carbon composites account for around half of the weight of the recently commercialised Boeing 787 Dreamliner (figure 12).

Figure 11: Use of carbon composites on Boeing and Airbus commercial aircraft

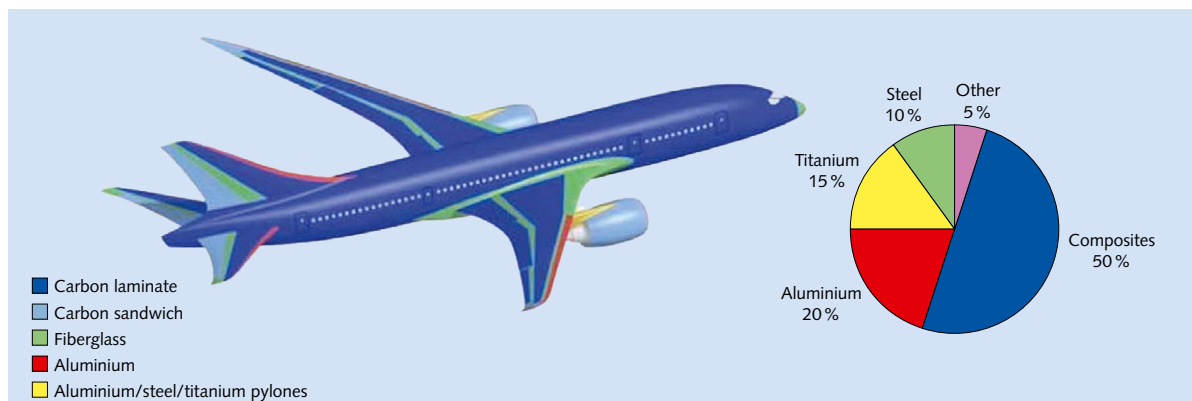


Source: Hexcel Corporation

Carbon fibre is a fibrous carbon material with a micro graphite crystal structure woven into carbon fabrics and inserted into a resin matrix to provide reinforcement. Although often used in simple products such as golf clubs and tennis rackets, it takes much more sophisticated technology to produce material suitable for constructing aircraft. Only a handful of companies such as Hexcel, an American company, and Toray from Japan, have mastered this technology.

We expect these companies to enjoy significant growth with production of aircraft such as the Dreamliner and the Airbus A350 XWB ramping up in the coming years. Further additional growth in the longer term may come from the mass-market automobile industry. Currently, the materials are expensive to produce and the market is limited to luxury and high-performance sports vehicles. However, efforts to bring costs down are set to make the products economically viable for the high-volume market.

Figure 12: Composition of the Boeing 787 Dreamliner by weight



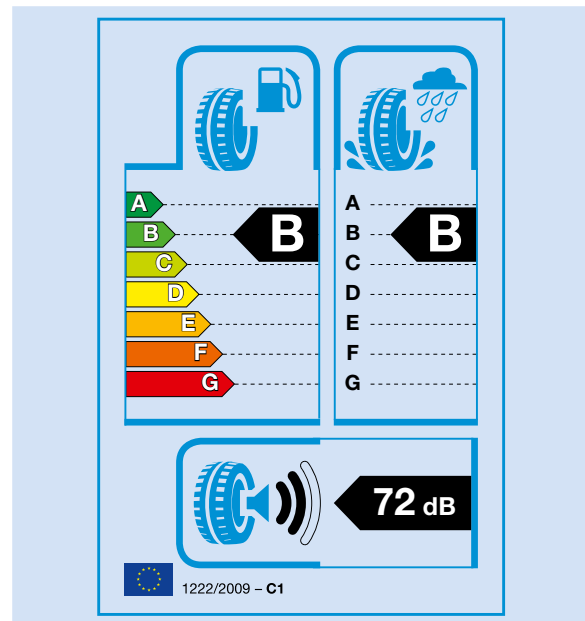
Source: The Japan Carbon Fiber Manufacturers Association

Demand for carbon fibre has been growing, and independent estimates for future growth of the global carbon-fibre industry are bullish. From 2006 to 2010, the annual growth rate of global demand for carbon fibre averaged 12.9 %, reaching nearly 40,000 tonnes in 2010<sup>1</sup>. Over the next five years, 2012–2017, the global carbon-fibre market is forecast to have an annual growth rate of 17 %, reaching 118,600 tonnes, with an estimated market value of 7.3 billion US dollars by 2017<sup>2</sup>. The industrial sector, including wind energy and automotives, represents around two thirds of global end-use demand for carbon fibre and is predicted to be the primary growth driver while demand in the aerospace and defense sector (currently around 17 % of global demand) is expected to more than double from below 8,000 tonnes in 2011 to over 18,000 tonnes in 2020<sup>3</sup>.

### 5.2 Synthetic rubber – riding on the road to success

One technology gaining significant traction amongst mass-market vehicles is high-performance synthetic rubbers. These materials enable greater performance when incorporated into tyres in areas such as grip in wet conditions, noise levels and reduced fuel consumption. By the end of 2012 the European Union will introduce mandatory labeling at the point of purchase for new and replacement car tyres, as shown in figure 13. This encourages the substitution of other rubber products by high-performance versions. Labeling has already been recently implemented in Japan, and is under discussion in countries such as the US, China, Mexico and Brazil. Figure 14 details the composition of a typical car tyre.

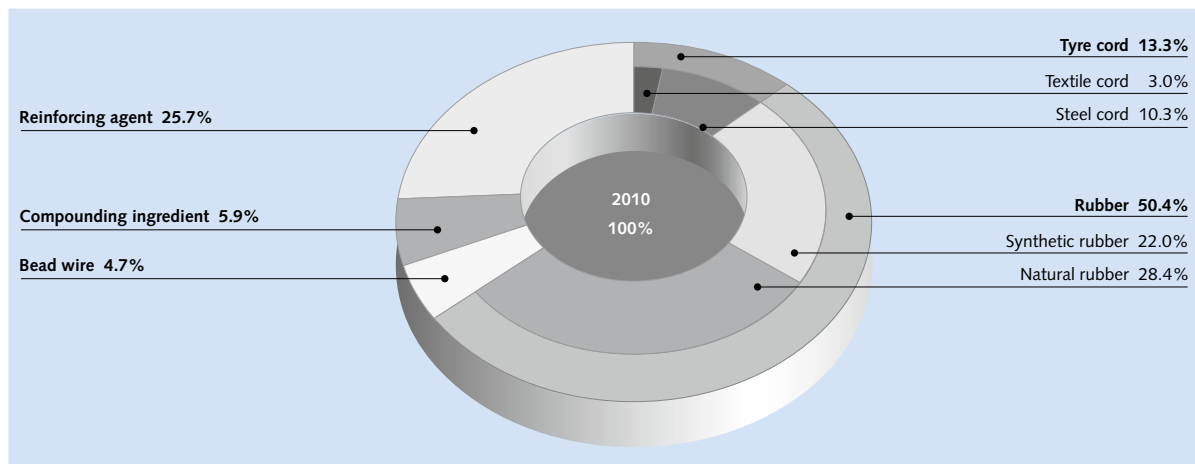
Figure 13: Tyre labeling for fuel consumption, wet grip and noise levels



Source: European Union

Global rubber consumption in 2011 was 25.9 million tonnes (2010: 24.9 million), of which 57.8 % is synthetic rubber, up from 56.6 % in 2010 as consumption of synthetic rubber outpaced natural-rubber consumption<sup>4</sup>. Demand for vehicles and tyres is a primary driver of rubber consumption, in particular strong demand for replacement tyres, and increasing sales of passenger and commercial vehicles in developing countries. The market for tyres is forecast to reach an estimated 187 billion US dollars in 2017, with a compound annual growth rate of 4 % from 2012–2017<sup>5</sup>.

Figure 14: Composition of a typical car tyre



Source: Japan Automobile Tyre Manufacturers Association

German company *Lanxess* is the leader in the field of high-performance synthetic rubbers. Inadvertently – and non-intuitively – the company is also a beneficiary of the large increase in natural-gas supplies in North America due to the surge in shale-gas production. The main raw material (feedstock) used to produce synthetic rubbers is butadiene, a by-product of petrochemical production. Petrochemicals can be produced either from ethane, a constituent of natural gas, or naphtha, a derivative of crude oil. As natural gas in North America is much cheaper on an energy-equivalent basis than oil, more and more petrochemical production is using ethane as the feed-

stock. However, this process yields much lower quantities of butadiene. Intuitively, the increasing structural shortage of butadiene should pose a major problem for synthetic-rubber manufacturers such as *Lanxess*. However, the company is the world's largest buyer of butadiene and has secure, long-term contracts with suppliers. The company also has a high level of pricing power to pass on the increasing costs of butadiene due to the increasing demand for their high-performance synthetic rubbers. The difficulty in sourcing butadiene on a long-term basis is actually a barrier to entry for new players, further strengthening *Lanxess's* position.

<sup>1</sup> Research in China; 2011. Global and China Carbon Fiber Industry Report, 2010–2011

<sup>2</sup> Smithers Apex; 2012. The Future of Carbon Fiber to 2017

<sup>3</sup> Roberts, Tony; 2011. The Carbon Fibre Industry Worldwide 2011–2020

<sup>4</sup> International Rubber Study Group; 2012. Quarterly Statistics, [www.rubberstudy.com](http://www.rubberstudy.com)

<sup>5</sup> Research and Markets; 2012. Global Automotive Tire Industry 2012–2017



# Annex

## Glossary

**Deepwater/pre-salt oil and gas production:** production below layers of rock and salt off the coast of Africa and Brazil.

**Horizontal drilling:** a technology allowing for horizontal access to layers of rock containing shale gas.

**Hydraulic fracturing (“fracking”):** a technology to extract shale gas by fracturing a rock layer, using pressurized fluid.

**Liquefied natural gas (LNG):** natural gas in liquid form to facilitate storage and transport.

**Natural-gas liquids:** oily liquids produced in conjunction with natural gas.

**Shale gas** is natural gas in rock formations. Improved extraction methods have enabled companies to tap this energy source in the past few years.

**Unconventional energy sources:** deepwater oil and gas, natural-gas liquids, liquefied natural gas, advanced bio fuels and oil and gas from shale geological formations.

## About the author

**Sreejith Banerji** is a portfolio manager within Vontobel's Global Equity Thematic Investing Team. In his role, Sreejith is responsible for the management of the Future Resources strategies. Sreejith has over ten years of investment experience mainly with a focus on the chemicals sector and previously worked as an engineer and mergers-and-acquisition strategist for Amec plc, a global engineering company focused on project management for the global energy, environmental, natural

resources and water sectors. Sreejith earned a Masters degree in chemical engineering from Imperial College in London and is also a CFA Charterholder.



Sreejith Banerji,  
Portfolio Manager



Bank Vontobel AG  
Gotthardstrasse 43  
CH-8022 Zurich  
Telephone +41 (0)58 283 71 11  
Telefax +41 (0)58 283 76 50  
www.vontobel.com



Private Banking  
Investment Banking  
Asset Management

Performance creates trust

**Important legal notice:** This document is for information purposes only and nothing contained in this document should constitute a solicitation, or offer, or recommendation, to buy or sell any investment instruments, to effect any transactions, or to conclude any legal act of any kind whatsoever. This document has been produced by Bank Vontobel AG. It is explicitly not the result of a financial analysis and therefore the "Directives on the Independence of Financial Research" of the Swiss Bankers Association are not applicable. The Vontobel Group and/or its board of directors, executive management and employees may have or have had interests or positions in, or traded or acted as market maker in relevant securities. Furthermore, such entities or persons may have or have had a relationship with or may provide or have provided corporate finance or other services to or serve or have served as directors of relevant companies. Although Vontobel Group believes that the information provided in this document is based on reliable sources, it cannot assume responsibility for the quality, correctness, timeliness or completeness of the information contained in this report.

Neither this document nor any copy hereof may be distributed in any jurisdiction where its distribution may be restricted by law. Persons who receive this report should make themselves aware of and adhere to any such restrictions. In particular this report must not be distributed or handed over to US Persons and must not be distributed in the USA. Any use, in particular the total or partial reproduction of this document or disclosure to third parties is only permitted with the prior written consent of Bank Vontobel AG.