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The Commodity Case – Introduction

We have to change towards a low-carbon society. The problem with carbon dioxide is: we don't smell it, we don't see it, it is colorless, tasteless and invisible.

Al Gore – Speech at the Paul Scherrer Institute, Switzerland, 21 June 2010.

1.1

Commodity Cycles – Past and Present

In August 1998, John Wiley & Sons, New York published my first book on commodities called *Profits from Natural Resources*. Oil was trading at \$10 a barrel, nobody was paying attention to natural resources, and the high-tech bubble was in full swing. Every investor jumped on the bandwagon of the Internet and computer stocks like Microsoft, Yahoo, Oracle, and Amazon. In those days Amazon was trading at \$5 a share – in August 2012 it was trading at \$230 a share (and by owning Amazon stock for 10 years you would have enjoyed a few stock splits on the way up as well)! At the beginning of the first decade of this century very few people were seriously investing in the basic resources of our world. Although my timing was a little ahead of what was going to unfold, the analysis of the book (i.e. the coming commodity boom) was 100% correct.

This book is not about speculation. This is not another commodity book about trading techniques in gold, silver, or copper. This book is not about exchange-traded funds (ETFs), leverage, selling short, or high-frequency trading. This book is a guide to liquid renewable energies called second-generation biofuels and solid biomass. I think this is one of the best investments you can make today. Such an investment is “early stage.” It is like buying Microsoft at \$5 a share. However, those investors who have the vision and the courage to get in early will reap the biggest benefits.

Before we dig into the subject of this book, I first need to give you the big picture of the commodity world. I shall give you the top-down view of the global commodity world before we make our feet wet in biofuels and biomass.

It is essential to understand that natural resources are *raw materials*. It is only after their transformation from raw to a pure material that they can be used in

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industrial or consumer products. Depending on the sector, the resources we collect from Mother Earth first need to be found, then undergo one or more of processes like pumping, refining, drilling, harvesting, melting, roasting, drying, crushing, spinning, pressing, recycling, and condensing. In addition, the finished goods need to be transported and stored safely to become valuable basic materials. Raw materials are called “commodities” when they are traded uniformly in bulk, in large quantities. Wheat is a commodity, but diamonds are not. Is water a commodity? Some people say yes, other people say no. Open for debate!

This transformation of a raw material into a pure basic material can take many years. With the exception of fast-growing staple goods like soybeans, sugarcane, and wheat, so-called natural commodity cycles are long cycles. For instance, it takes 5 years to grow a coffee tree and 7 years for a rubber tree before we can collect the latex. Oil in the North Sea was found in 1967 and it was only in 1977 that you could fill up your tank at the gas station with North Sea gasoline. Thus, it takes years and huge investments before additional supplies of commodities become available, and sometimes billions of dollars are invested just to keep the present supply intact or to bring new supplies on stream with very meager results. This is case today with copper and oil.

However, there is one big difference from all the previous cycles: all the three super-cycles in the twentieth century were caused by supply constraints. Commodity shocks like the Middle East oil embargo in 1973 and the Great Grain Drought in the Ukraine in 1972 were typically problems in the supply chain. This time, however, we not only have supply bottlenecks, but *additionally* we are witnessing *a huge new demand from new markets*. In Asia, the demand for raw materials is growing exponentially. Thus, I think this super-cycle will be very powerful in nature. Not only Asian countries, but also the United States, Brazil, India, and other large economies are experiencing rapid growth that is fuelling demand for all sorts of commodities. Energy is needed to drive growth, whereas metals and other basic materials form the inputs for what has been an explosion in infrastructure investments.

Imagine there is a lack of semiconductors in this world. We can go to India or China, build a factory, buy machines and robots, hire software and production people, and within 2 years we can produce as many semiconductors as the market can absorb. With raw materials it is a whole different story – the supply cycles of many commodities are very long, and at the same time the global demand for raw materials is exploding with rapid developing economies in China, India, and Brazil.

The global shortage of raw materials might not be resolved for some years also because of infrastructure bottlenecks and the long lead-time needed for new natural resources projects. A lack of investments in ports, in particular in Australia and Africa, is holding back imports and exports of important commodities such as iron ore and coking coal. If you go to cities like Singapore or Shanghai you can witness hundreds of ships waiting to unload or load cargo. A good example is steel. The current global bottleneck in the steel industry had its roots in the 1980s when the last commodity bull cycle ended and the former Soviet bloc economies opened

up to the West, making available extra capacity that took years to absorb. Since that time we have had 25 years of deflation, disinvestment, and lack of investments in drilling and mining. Now this oversupply of commodities has been consumed and absorbed. We are currently in a general supply squeeze, demand is booming, and it will take a decade before a sufficient supply of commodities or alternative energies comes on stream.

1.2

The Most Precious Commodity: Energy

The most precious commodity in the world is energy. Most energy comes from fossil fuels like crude oil and coal. When you take inflation into consideration and calculate the real price of oil, today's Brent crude oil price should be well over \$140 a barrel.

Estimating proven reserves in the ground is an art that even oil majors have not mastered. In 2004, Royal Dutch Shell had to revise its reserves by 20% downwards. Great Britain has been an oil exporter for the last 25 years and now the country has become an oil importer again because supplies from the North Sea are dwindling. Indonesia, a former OPEC (Organization of the Petroleum Exporting Countries) member, is also importing oil again and Mexico has the same problem. On the demand side, China is the second largest oil importer in the world today, although most Chinese do not yet have a car. Many Chinese do not even have electricity. When the *per capita* oil consumption in China rises to the level of Mexico, oil production must increase by 50%. China is the biggest energy consumer in the world and may import a total of 275 million tonnes crude oil in 2012. At the beginning of the new century this import figure was a modest 70 million tonnes.

According to many research reports from international think tanks and oil companies the demand for crude petroleum is forecast to increase by 35–40% by 2030 to around 120 million barrels per day. According to the “Peak Oil” believers, it is estimated that the worldwide conventional oil supply will be depleted within 40–60 years and we are within a few years “before or after” the peak in conventional oil reserves.

Most experts project a continuing rise, apart from short-term fluctuations, in the price of oil. They argue that prices of nonrenewable commodities, like crude oil, will rise significantly as the inventory (reserves) of the commodity decrease.

I think we have to deal with several oil scenarios:

1. If the global economy stays subdued in the coming 5 years, I do not believe we will see significant price rises in oil.
2. If the global economy grows steadily in the coming 5 years, I believe oil could move up to \$120–140 a barrel.
3. In 5 years time 11 million new barrels of oil from Canada, the United States, and Brazil will come on stream daily, providing an extra supply to the market. Thus, I think in 5 years we will have ample supplies and oil will move down to \$50 a barrel.

4. This downward trend will be reinforced by the increased production of second-generation biofuels and biomass coming on stream, replacing oil supplies.
5. Geopolitics play an important role: if for instance Iran, has developed nuclear weapons and if we face a new war with the Middle East, the oil price can easily double.

Energy use in the transportation sector includes the energy consumed in moving people and goods by road, rail, air, water, and pipeline. The transportation sector is second only to the industrial sector in terms of total end-use energy consumption. Almost 30% of the world's total delivered energy is used for transportation, most of it in the form of *liquid fuels*.

The transportation share of world total liquids consumption increases from 53% in 2007 to 61% in 2035 in the US Energy Information Administration (EIA)'s *IEO2010* Reference case, accounting for 87% of the total increase in world liquids consumption. Thus, understanding the development of transportation energy use is the most important factor in assessing future trends in the demand for liquid fuels. Figure 1.1 shows that renewables will be the fastest growing energy source.

Another good example is the International Energy Agency (IEA)'s outlook for American electricity generation from renewable sources. In Figure 1.2 we see that the largest share have biomass and wind. All renewable energy sources combined will increase substantially from 140 billion kW/year in 2009 to over 400 billion kW/year in 2035. Also the energy generation from wind and biomass will increase the most and in about the same proportion. According to the IEA's beliefs the electricity generation from waste, geothermal and solar power will increase a lot less.

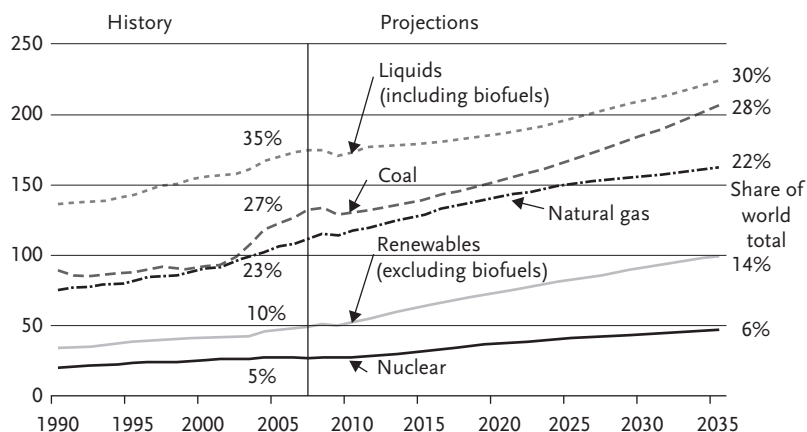


Figure 1.1 Renewables are the fastest growing energy source, although from a relatively small base (world primary energy consumption in quadrillion BTU; 1 BTU = 1.055 kJ). *Source:* US Energy Information Administration, *International Energy Outlook 2010*.

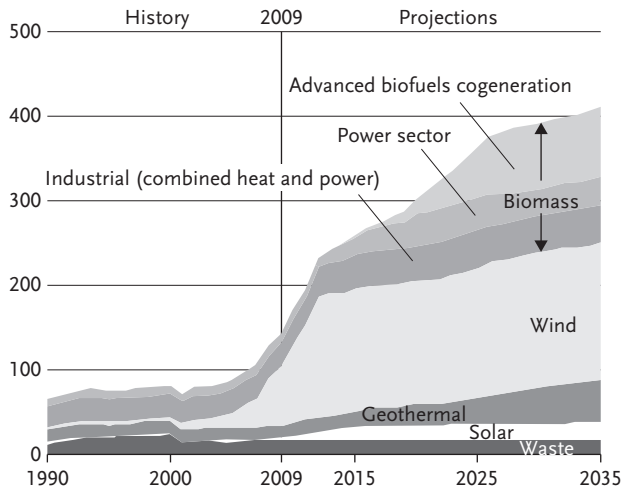


Figure 1.2 US renewable electricity generation, 2009–2035 (billion kW/year).
Source: US Energy Information Administration, *International Energy Outlook 2011*.

1.3 Cheap and Expensive

Many commodities are still cheaply priced. Prices are often well below the all-time highs, especially when we take inflation into consideration. Traditionally, commodities are priced in US dollars – a currency that gets cheaper versus most other currencies all the time.

When Bunker Hunt was trying to force a silver squeeze in 1979, he was holding 100 million ounces of the white metal, which skyrocketed to over \$50 an ounce. So silver prices at \$29 an ounce in August 2012 are still cheap (Figure 1.3).

The picture looks even more extreme when we take inflation into consideration. If we compare the price of silver in 1980 at \$48, today's silver price is insignificant. On 21 January 1980 at its all-time high, \$48 silver translates into \$135 in today's dollars. In other words, it would take \$135 today to equal the purchasing power of \$48 three decades ago. Looking at the Consumer Price Index (CPI), it takes \$2.81 now to buy what a single dollar bought then. Let us thank the Federal Reserve for this enormous stealth tax that has eroded all the capital we have saved ever since.

Even crude oil, trading at all-time highs in 2008 at \$149 a barrel, looks cheap today, especially as it is priced in cheap dollars as well (Figure 1.4).

Is it wise to invest in commodities? Selectively – absolutely. I think it is best to invest in the complete value chain of commodities that are growing independently from stock market moves. This means you should buy land, start plantations of sugarcane, teak wood, eucalyptus, or *Jatropha*, get a crop every year, get an income out of your crop, convert the agricultural or wood waste into agripellets and woodpellets, and sell these energy products at a high price for additional income.



Figure 1.3 Long-term silver prices. Source: www.futuresbuzz.com/silverlt.html.



Figure 1.4 Long-term oil prices. Source: www.futuresbuzz.com/crudelt.html.

Since we are relatively still in the early years of the new commodity boom, there is plenty of room for rising commodity prices and it is not too late to invest in commodities this way. With the exception of specialized newswires like CNN, Bloomberg, CNBC, or NTV in Germany, commodities are not well covered in the media. Seldom do magazines like *Time Magazine*, *Newsweek*, *Fortune*, or *Forbes* publish a good analysis on coffee, copper, rubber, or biofuel trends. There are not many good documentaries on commodities on television. I give speeches around

the world and it amazes me how poorly people are informed about this new liquid commodity group or feedstock called biofuels. Even the largest commodity trading firms are not yet dealing in biofuels or biomass. Likewise, the general public is not yet aware of investment possibilities in the complete value chain of renewable biofuels. Thus, if you invest now, you are way ahead of the curve and that is where the biggest profits are made! I think in a few years the supply of biofuels and biomass will increase, and most probably one or two biofuels will become traded commodities in liquid cash and futures markets. Simultaneously, more and more biomass will be recycled into renewable energy commodities.

In 2008, we witnessed a gigantic melt down of all assets, caused by the mortgage crisis in the United States. A global “deleveraging” unfolded and investors came down to earth. The stock of Citigroup was selling at \$500 a share in 2007. In August 2012 you can buy the stock around \$29 a share. The prestigious Swiss bank UBS was selling 5 years ago at CHF 40 a share. At the end of 2011 you could buy UBS at CHF 11 a share. Brazilian agricultural land was selling at \$100 a hectare 5 years ago. You are lucky if you can get it today for \$500 per hectare. That is the difference in investment style!

One of the big retail global banks, with over 500 derivative products like ETFs and baskets of stocks, informed me that in 2008 they had sold €2.5 billion in commodity products. Although commodity markets boomed in 2010, they did not sell more than €700 million in derivatives – less than one-third of their 2008 levels! In 2011, several banks started to shrink their investment bank departments. So do not think financial bank products – think hard asset investments.

1.4 Federal Reserve

The macroeconomic factors why commodity prices will rise further long term are very favorable.

The US Federal Reserve Board and other central banks maintain loose monetary policies. Excessive monetary stimulus, rapid credit expansion, and negative real rates always eventually lead hard assets, such as real estate, commodities, and precious metals prices, to rise as more and more money chases a limited amount of commodities.

Rising government budget deficits worldwide (at both federal and state levels) will add significant pressure to depreciating paper currencies, in turn providing another factor for rising commodity prices.

The US budget deficit in 2012 alone is bound to reach \$1.327 trillion. Just below record levels but still a massive amount to pay back to the lenders.

Central banks can create money out of thin air – a bank can issue a new bond with a few strokes on a keyboard, but it takes many years to increase global copper, zinc, or silver production. It takes an oil company 10 years to build a new refinery. Commodity production elasticity is low. Meanwhile, the combined broad money supply of the top 35 nations has risen by around 50% since April 2001.

Do not forget: commodity prices can rise even in recessions. During the 1970s, when US inflation was around 9% a year, the US economy was in a major recession – yet commodity prices kept on rising.

As the global economy expands, the demand for commodities will rise correspondingly and with it commodity prices. An economic recovery generally demands a higher usage of commodities, resulting in higher commodity prices. Another point worth noting is that commodity prices increase significantly in periods immediately after the end of a recession.

It is to be noted that many of the other commodities, such as soft agricultural commodities, are either derived from, or produced with, oil and gas products. In the United States, the food people buy in the supermarkets has traveled 1500 miles! Huge amounts of energy, water, fertilizers, and pesticides have been used to produce the food.

Maturing, disturbing geopolitical trends resulting in unstable markets and potentially adverse commodity distribution (e.g., Iraq, Saudi Arabia, Iran, Nigeria, and Venezuela) are going to cause commodity prices to rise.

The conditions in the commodities markets today are very different from the last 20 years. Since commodity prices were in a severe bear market since 1980, little new capacity has come on stream in the last few years with the result that, for instance, the mining capacity utilization rate now stands at 95% or higher. In addition, from the time exploration begins to the time new substantial reserves come into production, a minimum of 7 years elapses. Therefore, production capacities for most industrial commodities cannot be increased meaningfully in the short term, which means that cycles of rising commodity price tend to last 15–30 years.

Increased investment flows have helped improve most valuations, but commodities as an asset class are still emerging, and investors have significant opportunities to gain exposure and make gains in the medium to long term. This contradicts the view among some market participants that most actively traded commodities have already seen their price highs for now and could fall from their current levels.

1.5

Transformation to a Low-Carbon Society

I do not believe that, in the history of the planet, private enterprise has ever undertaken something as difficult and expensive as the transformation of an industrialized global economy from carbon to low-carbon.

Nothing so big, or so grand, or so urgent, has ever been accomplished alone. Thus, I want to make a prediction: with disasters like the recent oil spill in the Gulf of Mexico, the flooding of New Orleans, and the tsunami in Asia mankind realizes that Mother Nature plays havoc and that we have to protect our environment better than ever before. National policies are restricting carbon dioxide emissions more and more, so the demand for clean energy and especially recycled waste called biomass is skyrocketing. This is a sure thing – times are changing and climate

change is here to stay. Thus, investing in those commodities that lower carbon dioxide emissions is a very wise long-term, rewarding decision.

Intensive discussions are being held in the board rooms of every major company about safety, pollution, ecological consequences of accidents, insurance policies, and so on. Ecological damage caused by a company is now a major, major subject of any entrepreneurial activity.

1.6 Commodity Costs

The cost of harvesting and mining commodities is increasing continuously. Mining and oil companies have to drill deeper oil and metals, and in agriculture the prices of water, pesticides, and fertilizers keep on rising. Here is a good example: the world's largest open-pit copper mine is the Chuquicamata mine in Chile. Unfortunately, this mine will cease to be profitable during the next decade and Codelco is now building a new underground mine underneath, which would be one of the world's largest, most modern and efficient mining operations. Total exploration costs are an estimated staggering \$2.3 billion (Figure 1.5).

A biofuel is energy in liquid form, made from renewable sources like plants, trees, and even waste. Biofuels from renewable sources can be replicated and when harvested on a large scale the price of biofuel per hectare, per acre, or per tonne will keep coming down. We are still at the beginning of the biofuel trajectory. The solar industry is the best example of diminishing costs: the production of solar panels has been scaled up enormously, with China as the main producer. The energy generation and efficiency per solar panel keeps increasing, and the price of solar

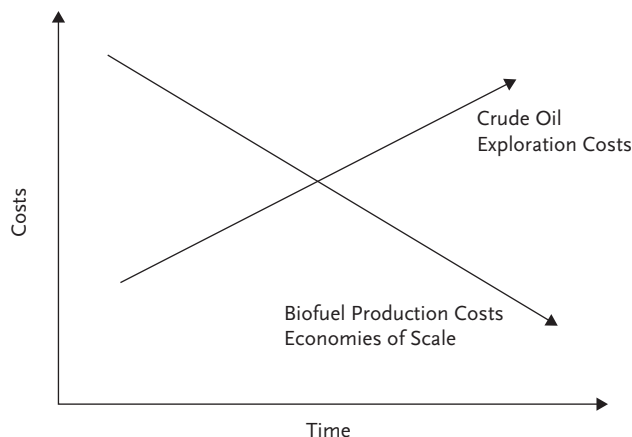


Figure 1.5 Rising crude oil costs, and increasing biofuel and biomass supplies. Long-term costs of biofuels are decreasing. *Source:* Mother Earth Investments AG Research.

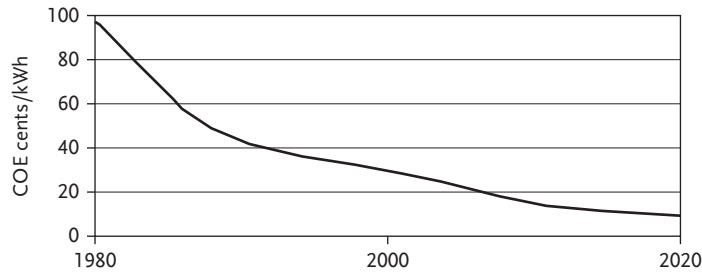


Figure 1.6 Costs of solar power from photovoltaics. *Source:* US Energy Information Administration.

panels is coming down. Figure 1.6 shows how the photovoltaic costs in the United States have come down from \$1 in 1980 to about \$0.18 today.

1.7

The “Per Capita” Factor

Investors know what is driving the resource boom: growing demand from China and India as well as restraints on increasing supply. However, what most investors have not quite grasped is the sheer enormity of these drivers. Often our understanding tends to lag behind reality; how many of us could think, for example, 15 years ago that e-mails or social networks like Facebook would become such dominant factors in the way we communicate?

Likewise, prices of most resources will go higher and for longer than most investors currently imagine. The key is *per capita* demand. China currently consumes just less than 4 kg of copper per person per year; Japan, Germany, and other industrialized countries each consume 12–14 kg. Take oil: as you can see in Figure 1.7, the USA currently consumes around 21 million barrels of crude oil per day and China around 6 million barrels. If we compare the consumption *per capita* in each country, the average American citizen consumes around 27 barrels a year, industrialized countries from Korea, Japan to Europe around 17 barrels and a Chinese citizen 2.7 barrels per year.

Significantly, the pattern of demand growth in all these countries has been remarkably similar: from very low starts, slow appreciation as the economy starts to industrialize until a “takeoff” point is reached; this is then followed by rapid acceleration that lasts a decade or more until the economy matures and *per capita* consumption levels off.

The pattern has been the same, for country after country, in resource after resource. What is significant about China, of course, is the scale; there are an awful lot of capita’s in that country – about 20% of the world’s population – and they all want the same things we take for granted in the industrialized countries (better housing, electricity, automobiles, stoves, refrigerators, etc.). All of these things require resources and far more than what they replace. Increasingly, not only do the Chinese people want these things, but also more and more Chinese

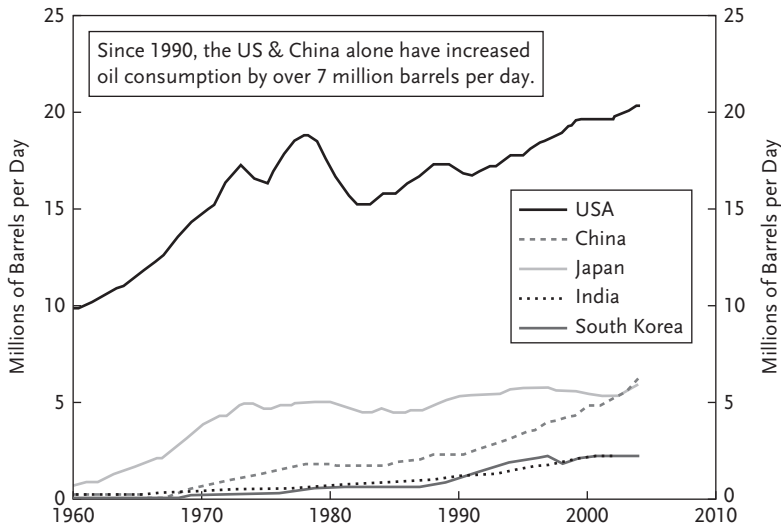


Figure 1.7 Oil consumption by country. *Source:* US Energy Information Administration.

citizens are moving up the middle-class ladder and have the financial means. China today is right at the cusp of that take-off point when *per capita* consumption starts to accelerate.

Now, China will not necessarily move to the industrialized world norm in the consumption of various resources. It may use less oil per person than other countries, for example. It uses more coal for power and plans on using more nuclear power; there may be increased efficiencies and more viable “green” alternatives. However, China’s consumption of oil and other resources will increase; in 2010, it became the world’s number one oil consumer. It may not reach the industrialized world norm, but it will approach it. Even at one-third the industrialized norm of oil consumption, this would mean a doubling of China’s *per capita* demand. Similarly, with copper: perhaps China will eventually use only half as much copper as other industrialized economies. That would mean a 50% increase in *per capita* consumption – remember, again, we are talking about *per capita* consumption. China is already the top consumer in absolute numbers for most commodities.

Thus, based on history, there is enormous potential left and we are only at the end of the beginning. Many commentators are concerned about the effect China’s tightening policy will have on the economy and demand for resources. However, even if China’s growth slows from 9 to 5%, that would still imply a dramatic and continuing increase in demand for resources, and for many resources today there is no meaningful inventory.

I am not suggesting that there cannot be a slowdown in China’s economic growth. I am suggesting that, unless China’s development comes to a halt, the

demand for resources will accelerate over the next 5–10 years and there is nothing on the horizon now to suggest that that demand can be met without higher prices. The biggest problems in China are the discrepancy between the incomes in rural areas and in coastal zones. Inflation keeps creeping up and it remains an open question if the Chinese government will be able to keep inflation in check, and thus domestic stability. China is a “leading indicator” in commodities. Unrest in China and a declining Chinese demand will have profound affects on world trade and commodity demand.

1.8

Demographics: India and China

I expect India to overtake China in population around 2030. In 20 years India will have 1.5 billion inhabitants and China as well. These 3 billion people will be 40% of the global population! Thus, the commodity consumption from these two countries alone will be staggering (Figure 1.8).

Still the question remains: we now have 7 billion people on Mother Earth. The global population between 1987 and 1998 increased from 4 to 5 billion people. Why did commodity prices not increase simultaneously? Prices of commodities – in real terms, adjusted for inflation – have not risen dramatically. Why not? It just shows that prices are sensitive to consumption and in recessionary times like in the 1990s less consumption means lower commodity prices. Thus, the key with commodity prices is personal income, personal wealth, and jobless rates – all

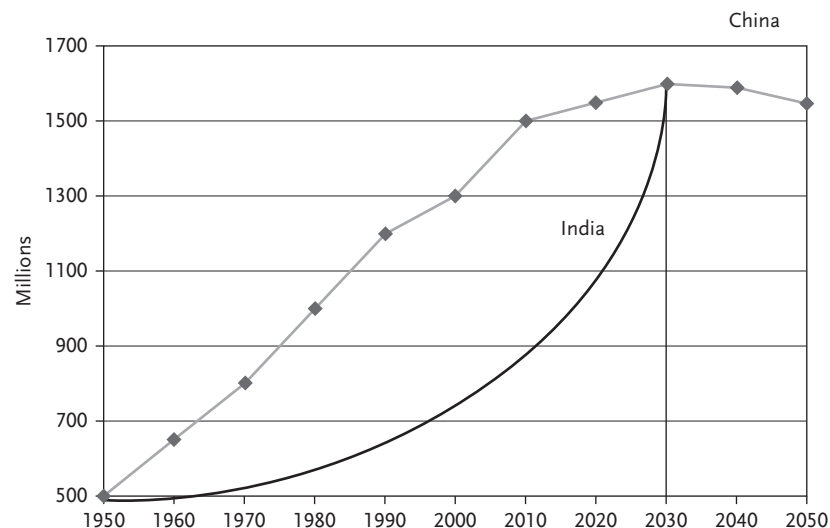


Figure 1.8 India's population will overtake that of China by 2030: India 1.5 billion + China 1.5 billion = 40% of the global population. *Source:* Mother Earth Investments AG Research.

factors that determine commodity consumption. If indeed the standard of living of the poorest of the 7 billion people would improve, we would see a substantial increase in commodity prices.

1.9 Oil, and First- and Second-Generation Biofuels

We all know that oil is not renewable and that it is polluting our environment. As we analyze the oil markets daily, it is our conviction that non-OPEC countries like the United States, Mexico, United Kingdom, Indonesia and Norway are “over the top” in their oil production, and that slowly but surely their oil production will continue to decrease. This is the “Peak Oil” theory: more than half the reserves in these countries are gone and whatever effort is made or technology is deployed, less and less oil will be pumped up. On the other hand, we believe that OPEC members like Saudi Arabia, Iran, and so on, still have ample reserves and that they will reinforce their grip on the oil markets. So the big question is: what is the clean energy of the future? Is it energy from one source or will it be a combination of several energy sources? And which energy will be used less and less? I discuss this theme with many commodity experts and opinions are as diverse as there are commodities on Mother Earth.

Renewable energy from the first generation is basically vegetable oil from plants growing on agricultural land. However, with agricultural land plateauing in our world and the global population increasing from 7 to 9 billion people in the coming 30 years, agricultural land should be used to grow food for human beings and livestock, and not for producing gasoline or diesel for our cars. This is because less land will be available for agriculture. Only a country like Brazil, where there is still a lot of barren land that can be converted into fertile agricultural land, is a good exception. If a country has vast amounts of land, sugarcane production to make ethanol and sugar simultaneously can coexist very well. However, most countries do not have this luxury and shrinking agricultural land due to urbanization is the norm in our world. From 1950 to today the available cropland per person in our world has shrunk from 0.5 to 0.2 hectares. Are we heading towards “Peak Food”?

Today, the world’s farmers feed 7 billion people. Over the next 50 years, farmers will have to grow more food than has been produced in the previous 10 000 years combined. Will they be able to do it? Not without help. If farmers could just plant more acreage, there would not be a problem. In this book I show how it can be done with research, and systems like intercropping, double cropping, and fertilizing marginal land. Figure 1.9 shows the decline in the amount of arable land per person on Mother Earth.

Blame erosion, desertification, or urban development. Mother Nature will continue to mete out natural disasters – and the world’s population will continue to grow relentlessly. So get ahead of the curve. Invest in companies that invest in agricultural research and make agriculture more efficient.

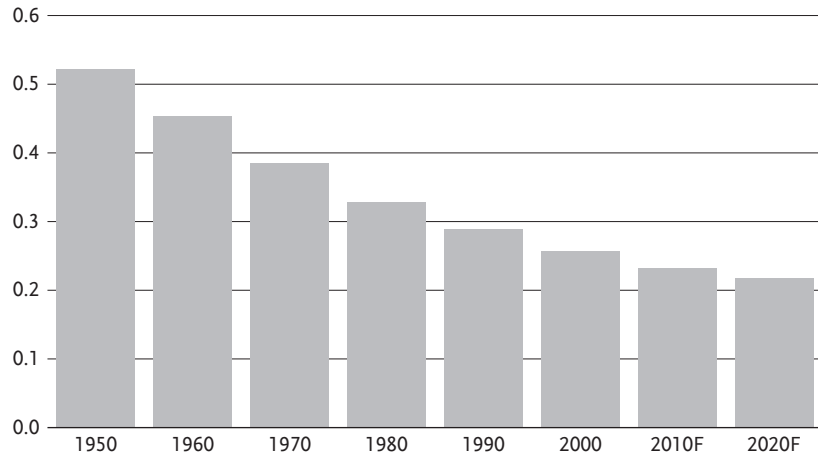


Figure 1.9 Hectares of arable land per person. *Source:* UN Food and Agriculture Organization/US Census Bureau.

1.10

Nuclear Energy

Nuclear energy is not an option for many countries. In Asia, nuclear energy is big in Japan and China. In Europe, more and more resistance pops up against the use of nuclear energy, with the exception of France, where nuclear power has been traditionally the largest source of electricity generation. We witness an increase of electricity use in cars and all kinds of devices like mobile phones and laptops. Put simply, electricity is an increase in molecules speeding around themselves, and if the electricity is not used the speed slows down and electrical power “evaporates.” If you do not use your mobile phone for a week your battery has emptied considerably. The same phenomenon occurs with hydrogen – a powerful source of energy, but difficult to store. Even when you store hydrogen in a tank, the gas manages to escape and evaporate over time.

The investment strategy of one of the world’s largest commodity traders, with whom we work closely together, goes clearly towards energy generation and trading from renewable, *second-generation biofuels* and cultivate plants and bushes like *Jatropha*, *Pongamia* (*Millettia Pinnata*), *Cranbe*, and *Camelina*, which all basically grow on marginal uncultivated land in order to produce liquid fuels. In addition, biotechnology plays a major role and enzymes can change the arrangements of molecules, so that waste, wood, and sugars can become biokerosene. I will describe in this book how we can move towards a low-carbon society. This is the big future and this is the area where the big commodity companies are making big investments. You can do this for your portfolio as well.

1.11

Eleven Megaforces

We are witnessing the greatest wealth shift of all time – from industry to mining and agriculture, from the traditional industrial power centers in the West to new power centers in the East and South, and from paper assets to hard assets.

Mother Earth is exposed to the following megaforces:

1. The global population explosion and rising incomes are fuelling a parallel explosion in the demand for resources, which is bullish for commodities like grains and energy.
2. One thing is certain: we are constantly exposed to changes – and the biggest change of them all is “climate change” – the cause of “global warming.” Global warming causes extreme weather patterns, which threaten to destroy a larger portion of the world’s crops with floods, droughts, and other disasters. The picture is especially bullish for slow-growing plantation crops like cocoa, coffee, rubber, palm oil, and *Jatropha*. They take 5–7 years to grow and supply cannot be increased overnight. After 40–50 years they must be replaced, like 50% of all tea plantations in Sri Lanka or cocoa plantations in the Ivory Coast.
3. The housing bust, the mortgage meltdown, and the credit crunch guarantee a US recession, which is, I say, very, very bullish for commodities. A new upward cycle will start one day and demand for raw materials will increase likewise.
4. Massive money pumping by the US Federal Reserve, which results in a devaluation of paper money and a trend towards hoarding hard assets. Consequently consumer prices will rise like never before, all of which is very, very, very bullish for commodities.
5. Keeping it real: the global transition from paper to tangible assets is just getting under way. With the Federal Reserve and other central banks pumping so much money into the financial system, yet getting rather muted economic results, many investors are debating whether inflation or deflation will ultimately prevail. We think that inflation and deflation can in fact *coexist* as a new economic paradigm. This economic environment shows moderate economic growth and an underperformance of traditional paper assets, like stocks and bonds. Commodity prices, however, will soar, along with real asset values. Agricultural commodities and farmland are doing well in such a scenario, while US stock and bond returns are lagging. This is a structural shift away from the regime of the past 30 years, in which paper assets have outpaced real assets 5 times over. The 1970s were particularly painful because stagnating growth was accompanied by high inflation and extremely high interest rates. Today’s new environment is different. There is not the same pressure on the Federal Reserve to hike rates as there was 30 years ago.

6. Food crisis. I think we are at the verge of a serious food crisis in many parts of the world. The question is not how we are going to provide food for 9 billion people in 2050, but how we are feeding 7 billion people today. This book is not about “first-generation biofuels.” It is not about palm oil, soybean oil, rapeseed oil, and corn. These staple crops should remain reserved to feed humans and animals, and not be used for energy purposes. This book is about the second-generation biofuels, which do not grow on agricultural land and which do not compete with food.
7. It is my view that commodity-based, resource-rich economies will continue to do very well. Among them: powerhouse Brazil (where there are 4–5% real yields currently), Canada, Turkey, Chili, and Southeast Asian nations, like Indonesia and Malaysia. We predict a continued US dollar depreciation of 20–40% over the next decade. It will be a broad-based natural devaluation against all currencies.
8. African nations will supply China with oil and copper, and Europe with woodchips, palm kernel shells, and electricity. Angola, Nigeria, and Somalia are big oil suppliers, and China already has a big presence in Africa and invests in the complete value chain, from oil drilling to copper mines. Wood waste from Nigeria and Ghana will be compressed to woodpellets and shipped to Europe. The Sahara will become the largest solar center in the world to supply electricity to Europe.
9. The protein play. The next 10 years should underscore the shift to real asset investments that began around 2000. In particular, as more emerging economies like China, India, and parts of Latin America “consume” their way toward growth – rather than export – their diets will include more protein, intensifying the need for both food and feed and alternative biofuels. Call it a “protein play.” At their spending peak, average US citizens were consuming \$1.60 of goods for every \$1 of income. In contrast, Brazilians consume just \$0.35 for every \$1 of income and Mexicans, \$0.60. As emerging-market consumers spend more of what they make, upward pressure will be put on agricultural prices, as well as increasing the value of farmland.
10. This shift toward commodities means that power and capital will move not only from West to East but from North to South as well. Asian nations such as Indonesia, Malaysia, Singapore, and Thailand, South American countries such as Argentina, Colombia, Chile, Uruguay, Australia, and Brazil will do very well and their currencies will remain strong. The classic ingredients of rising consumer demand, a demand for sustainable energies, tight supplies, and monetary inflation are all coming together at once.
11. Stringent EU carbon regulation today affects 11 000 major polluting industries in Europe, such as the mining industry, power plants, cement, paper, chemical industries, and airlines. These carbon dioxide emitters either keep on polluting and will be forced to pay for their carbon emissions or they will introduce clean renewable energy in their boilers to cogenerate energy and lower their carbon bills. Unfortunately, Europe does not produce enough waste that can be recycled.

So the feedstock for woodpellets, agripellets, woodchips, and so on, must come from non-traditional sources like the United States, Africa, Russia, Africa, and Asia. As you read this Introduction big long-term supply contracts are being signed between buyers and sellers. The sellers did not know that their “waste” was a gold mine and are now happy to discover that their waste is worth a lot of money. Smart buyers are happy to secure long-term supply chains and cofire coal with biomass.

1.12 Resource Wars

Still, the long-term fundamentals of commodities, particularly of oil, are by far more compelling than the those of US equities – this especially since according to several leading historians, including Arnold Toynbee, rising commodity prices have always turned up the war cycle, as the drive to secure the supply of finite and scarce resources intensifies. This should be particularly true for China, whose economic Achilles heel is a lack of water, food, oil, and other industrial commodities. I fear, for instance, that Iran is secretly developing nuclear arms and when this escalates into a new war in the Middle East, oil prices will rise substantially.

Figure 1.10 illustrates that most crude oil we consume today comes from politically rather unstable countries.

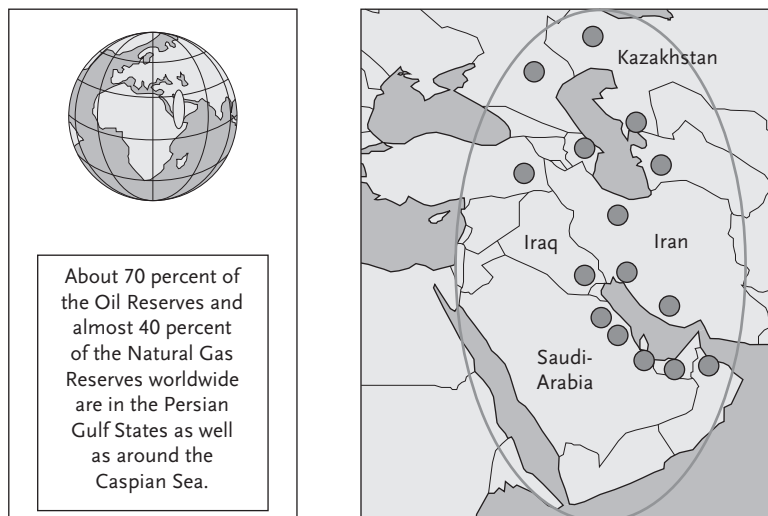


Figure 1.10 Energy ellipse and the Islamic World. *Source:* Mother Earth Investments AG Research.

1.13**Geopolitical Shift in Oil Production**

Luckily, 10 years from now oil will no longer mainly be flowing from the Middle East to the United States, Europe, and Asia. Due to technological developments and new discoveries, new sources of oil are being explored in new areas of the world, making democracies much less dependent on oil flowing from countries like Saudi Arabia, Iran, Iraq, or Venezuela.

A lot of new oil deposits have been found in the Western hemisphere. Indeed, in the exploration cycle of oil it takes around 10 years to find, pump, refine, and transport new oil to your local gas station. However, major technological breakthroughs have been made, unavailable 10 years ago, and large pockets of new oil supplies are being made available from Alberta in Canada, North Dakota and South Texas in the United States, and Brazil.

The oil production from tar sands in Canada stands at about 1.5 million barrels today and this is already a bigger production than Libya's output when Gaddafi was still in power. I expect that Canada's oil production will be ramped up to 3 million barrels around 2020. By then Canada will become the fifth largest oil producer in the world after Russia, Saudi Arabia, the United States, and China. Of course, there are great environmental concerns. On average, carbon dioxide output from gasoline produced from oil sands is about 15% higher than conventional fossil fuel oil. However, oil sands do contribute greatly to energy reliability and security. More than 50% of Canada's oil exports come from tar sands and this percentage will only increase in the years ahead.

In the United States, new shale gas techniques and horizontal drilling have been developed to explore new deposits in North Dakota and Southern Texas. It is now possible to extract oil from non-porous dense rock formations. Without these new extracting and drilling techniques oil would not flow. North Dakota is already producing 500 000 barrels a day. I expect that by 2020 the United States will also produce a total of around 3 million new barrels of oil a day.

In 2005, Brazil discovered huge offshore oil deposits below a layer of salt, which is around 2.5 km thick. The state-owned oil company Petrobras had the technology to "look" through the salt belt and discovered these new deposits. Progress to pump oil from these deep-sea pockets is on track and Brazil expects to produce around 5 million barrels a day by 2020. This is twice Venezuela's output and also more than the present oil production in Saudi Arabia. Thus, next to sugar and soybeans, Brazil will become a powerhouse in oil as well.

This is a real paradigm shift, which can add a substantial new oil production of 11 million new barrels a day by 2020 in the Western hemisphere. So the new oil will flow more North to South and South to North, instead of East to West.

1.14**Oil Companies, Production, and Transportation**

The effect of the 2010 oil spill in the Gulf of Mexico has consequences for both the demand and supply side of the oil market, but to varying degrees. Policy on

demand-side measures, carbon legislation, supply substitution, and energy regulation are all likely to be affected. Overall, however, we think that the supply-side consequences are likely to be more severe.

Despite the oil spill, the large oil companies remain, by far and large, focused on oil. Even before the spill, most of them were devoting a lot of their research and development to alternative energies; for example, Exxon put in \$500 000 into an electric car-sharing program in Baltimore, participated in the development of unconventional natural gas plays in Canada, and announced a \$600 million partnership to develop next-generation biofuels from algae in 2009.

BP, in fact, pioneered much of the investments in the renewable sector, announcing in 2005 that it had plans to double its investment in alternative and renewable energies to create a new low-carbon power business with the growth potential to deliver revenues of around \$6 billion a year within the next decade.

However, alternatives have remained a minor contributor of revenues compared to oil and this is unlikely to change soon. There might well be a step-up in the amount of work done in the renewable sector, but as long as oil remains the key transport fuel in the world, these large oil corporations are unlikely to move away from the production of crude.

The big push in renewable energy will not come from the oil majors. Feed-stock development will come from companies specialized in all aspects of agriculture. In addition, high-tech companies with research in biotechnologies will support the development of new energy sources like waste, grass, woodchips, and algae.

Table 1.1 shows how much it costs to fill up a tank: from a luxury sports car to a cruise liner.

Table 1.1 What does it cost to fill up the tank?

Vehicle	Costs
Bugatti Veyron (the fastest street-legal production car in the world; purchase price €1.4 million)	100 liters Super Plus for €158 (if you put the pedal to the metal the tank is empty in 15 minutes)
Leopard 2 main battle tank	1160 liters for €1541
Eurofighter jet plane	6215 liters "Jet A1" kerosene for €3418
Airbus A380	310 000 liters "Jet A-1" kerosene for €170 500
<i>Queen Mary 2</i> luxury liner	5350 tonnes heavy crude oil (type IFO380) plus 3885 tonnes marine gas oil) MGO: total €4.8 million

