



## The Absolute Return Letter May 2011

### The Case for Human Ingenuity

*“When you buy commodities, you’re selling human ingenuity.”*

Dylan Grice on why investing in commodities for the long run is a bad idea (SocGen Cross Asset Research, December 2010)

*“This faith in the human brain is just human exceptionalism and is not justified either by our past disasters, the accumulated damage we have done to the planet, or the frozen-in-the-headlights response we are showing right now in the face of the distant locomotive quite rapidly approaching and, thoughtfully enough, whistling loudly.”*

Jeremy Grantham on why the world is facing a paradigm shift on commodities (GMO Letter, April 2011)

*Before I do anything else, please allow me, on behalf of Tricia, to thank the many of our readers who supported her during her recent marathon challenge. Tricia completed her very first marathon in 3:55 which we are all very proud of although, Tricia being Tricia, she thought she should have done better. More importantly, though, because so many of you chose to support her, she blew right through her target and ended up collecting over £3,000 for Breast Cancer Care. She has asked me to mention how much this meant to her and how grateful she is for your support.*

On 1<sup>st</sup> March 2004 we published what I still consider the most controversial letter I have ever written. In the letter I predicted that oil prices would exceed \$100 per barrel within the next decade (you can see it [here](#)). That morning (Brent) oil prices were hovering just over \$33, and \$100 oil prices seemed a ridiculous prospect to most people. Almost exactly four years later, on 29<sup>th</sup> February, 2008, the \$100 barrier was broken for the first time.

#### *The End of the Oil Era*

I don’t think I have ever written a letter which provoked more reaction, much of it of the kind that is not suitable for re-production. And, no, I am not reminding you of this fact just to cover myself in glory. In fact, it was not even my own idea; the logic behind the outrageous forecast came from our economic adviser, Woody Brock. The reason I bring it up now is that, after careful consideration, I have decided to reverse my long-standing bullish view on oil prices, as I believe we are approaching the end of the oil era - and this time Woody Brock has nothing to do with it, so don’t blame him if I turn out to be wrong.

There are essentially three reasons why I think oil prices will go through a rather dramatic correction over the next several years:

1. Many investors who, in recent years, have added commodities to their portfolios as a hedge will ultimately be disappointed by the lack of diversification this asset class offers;
2. Governments and regulatory authorities, both in Europe and the United States, have effectively declared war on commodity speculators, and the area will become subject to a lot more scrutiny and regulation in the years to come;

3. A number of new alternative energy forms are in much more advanced development than many investors realise and will, over the next 3-5 years, become serious alternatives to oil, particularly as far as transportation is concerned.

There is enough material on this subject for a book, let alone a newsletter. I always try to limit myself to no more than 7-8 pages, as anything longer than that is likely to end up in the trash bin. For that reason, I will only touch briefly on the first two subjects in this letter and then pick up on them at a later stage. Most of this letter will instead focus on the third and final point listed above.

*Don't go short (yet)*

Before you short everything that contains the letter sequence OIL, let's pause for a reality check. The current lack of stability in the MENA region and the recent killing of Osama bin Laden certainly increases the probability of short term supply disruptions and hence higher oil prices. Hence I wouldn't be at all surprised, if oil prices actually rise further before they come down quite spectacularly. Furthermore, given crude oil's versatility (it is the key ingredient in lubricants, plastics, certain types of fabrics and asphalt to mention but a few), the world is not likely to run out of ideas on how to find uses for oil anytime soon.

However, that is not required for oil prices to collapse. The oil market is a finely balanced creature characterised by inelasticity on the supply as well as the demand side. With just over 60% of the 89 million barrels consumed every day going towards transportation, all you need is for one or two of the groundbreaking new technologies to come through, and the wind will come out of the oil price.

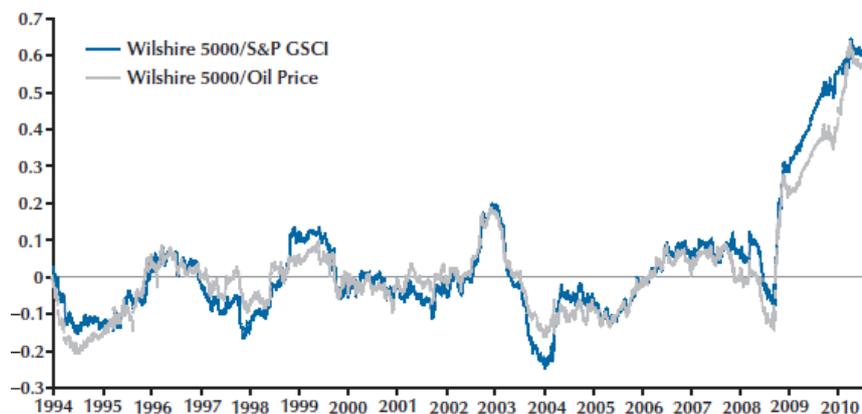
On an equally pleasant note (I am in my optimistic mood today), it could also mean the end of current day geopolitics, where we are forced to suck up to the tyrants who run many of the oil rich countries. What a delightful thought!

*Commodities a diversifier?*

I first wrote about the growing importance of financial investors in commodity markets in the [May 2010 Absolute Return Letter](#) and concluded that there is a strong link between the rapidly growing interest in commodities from the financial community and the rise in commodity prices.

Financial investors have fallen in love with commodities for at least three reasons – (i) they are considered an effective hedge against inflation, (ii) they are perceived to be an excellent diversifier in a traditional portfolio due to the low historical correlation with bond and equity returns, and (iii) they are seen as a play on the growing dominance of emerging market economies.

**Chart 1: Rolling Correlation between Equity and Commodity Returns (Daily Observations, 1-Year Window)**



Note: The equity index is the Wilshire 5000. The commodity index is the S&P GCSI. The oil price is the domestic spot price on West Texas Intermediate crude oil.

Source: Federal Reserve Bank of St. Louis, Haver Analytics.

Commodities certainly used to be a great diversifier, but that was before financial investors invaded the space. Now, as investors look to gain exposure to emerging economies through commodities, investing in this asset class has become a risk trade rather than a risk diversifier. A recent study conducted by the Federal Reserve Bank of St. Louis<sup>1</sup> highlights the problem as demonstrated by chart 1. My prediction is that there will be more than a few disappointed commodity investors when we go through the next significant equity bear market and commodities don't offer investors the protection they used to.

It has been obvious for several years now that demand for commodities from the financial sector has been on the rise but, at the same time, there is no denying that so has commercial demand (mainly due to sharply rising demand from China and other emerging economies). What remains unclear is precisely *how much* comes from one source and how much from the other.

I have recently been introduced to some of the best research I have seen for a long time. It is produced by a research boutique in the Boston area called Veneroso Associates. It is not cheap but it is brilliant (I guess you get what you pay for). Frank Veneroso published a paper last week on the subject of fundamental versus speculative demand in the oil market<sup>2</sup>, and he blew a big hole through the argument that the recent rally is down to commercial operators being prepared to pay a higher risk premium as a result of the unrest in the MENA region:

*"If this were the case commercials would be hoarding physical oil and hedging with long positions in the futures market. In fact, OECD crude and product stocks are at roughly their five-year average. Though final users may have filled their tanks, there is no evidence in the data that there has been hoarding by commercials."*

*Governments on the war path* Frank Veneroso concludes by saying that, in his opinion, there is a speculative premium at the order of \$20 per barrel built into the oil price at current levels, and he is not alone in holding this opinion. Powerful political leaders such as Presidents Obama and Sarkozy have both expressed concerns about the effect of speculation on oil prices, and there is rising evidence of regulatory authorities around the world attempting to clamp down on the 'dark forces' of commodity speculation (see for example recent articles in [The Daily Telegraph](#) and [The Wall Street Journal](#)).

The ramifications of the Great Recession are still felt everywhere but nowhere more so than on government budgets, as the tax payer continues to foot the bill for the irresponsible actions of the financial sector. What Obama and Sarkozy are really saying is that they will simply not allow a repeat of the 2008-09 financial disaster, which nearly took down the global economy. The earlier referred to research paper published by the St. Louis Fed sums up the government take on the use of commodity derivatives quit neatly:

*"Trading in derivatives does not affect the fundamentals of supply and demand in any obvious way. The derivative trades sum to zero—for every winner there is a loser, for every gain there is an equal loss. Financial firms can write an arbitrarily large number of contracts betting on a future price without necessarily affecting the level of that price."*

*"However, an arbitrarily large number of contracts means that there can be an arbitrarily large number of losers. The important policy question is whether the taxpayer is at risk for counterparty failure in OTC trading when some financial firms incur large losses. If a large*

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<sup>1</sup> "What explains the Growth in Commodity Derivatives", Federal Reserve Bank of St. Louis, February 2011.

<sup>2</sup> "Oil: The Last \$20, Speculation And Investment, Not Fundamentals", Veneroso Associates, 26 April, 2011.

*portion of these investments is made by financial firms that would likely fall under the protection of the government's safety net, then the firms that win will retain their profits while those that lose may shift the burden of their losses to the taxpayer. There is a public interest in preventing large-scale betting by institutions protected by the government's safety net.*

*"It is not a zero-sum game for the taxpayer."*

The government's concerns do not stop there. Only a few days ago, U.S. Attorney General Eric Holder announced the formation of the so-called *Oil and Gas Price Fraud Working Group*, which is mandated to monitor oil and gas markets for potential violations. You may recall that his predecessor on the post, Michael Mukasey, back in 2008 suggested that organised crime was becoming actively involved in commodity markets. I am sure you haven't heard the last thing from the Attorney General on this matter.

One lesson I learned very early in my career, and which has stuck to me like super glue ever since, is *never fight the Fed*. If you allow me to freely translate that to 'never fight the government', you probably get my point. If the authorities are hell bent on cracking down on commodity speculation and manipulation, it is a fight that the speculator and manipulator will ultimately lose.

*Differing opinions*

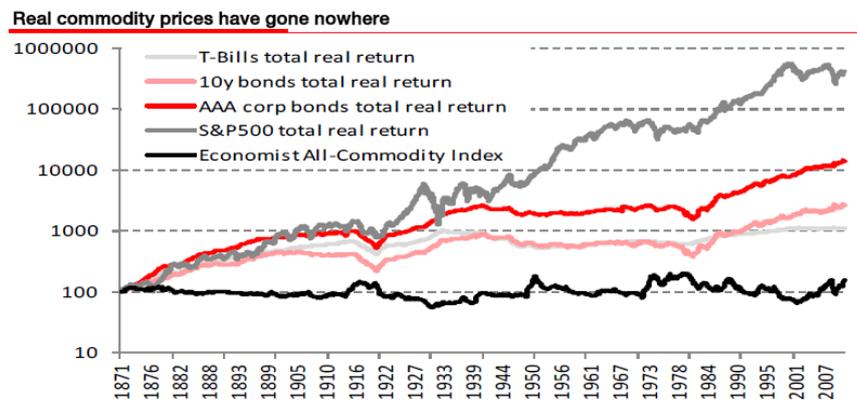
Now, this is where Dylan Grice and Jeremy Grantham enter the frame. They are both classified as 'must reads' in my little note book, and I have the utmost respect for their work. When it comes to commodities, though, they are deeply divided. While Jeremy subscribes to the view (which is rapidly becoming the consensus) that oil price inflation is no longer transitory but structural in nature, Dylan believes that it is a mistake to invest in commodities for the long term.

If you haven't already done so, I suggest you read Jeremy's latest quarterly letter which began with the following words:

*"The purpose of this [ ] piece on resource limitations, is to persuade investors with an interest in the long term to change their whole frame of reference: to recognize that we now live in a different, more constrained, world in which prices of raw materials will rise and shortages will be common."*

Dylan, on the other hand, is of the opinion that the views expressed by Jeremy do not take into account man's ingenuity which, in Dylan's opinion, explains why the long term return on commodities is zero (see chart 2).

**Chart 2: The Long Term Return on Various Asset Classes**



Source: SG Cross Asset Research, GFD

*Introducing new technologies*

So, to sum it up, oil prices may stall as investors realise commodities won't really do the job they were meant to, or the government may deliver the commodity market a fatal blow of some kind, or (and this is

what the rest of this month's letter is about) some groundbreaking new technology may do the dirty job for the government.

'My' list of new technologies is the result of a several weeks of research but is by no means complete (I would welcome any emails with opportunities that I have failed to mention). Please also bear in mind that I am an economist, not an engineer, so don't harass me if I occasionally use technically incorrect terminology. Stay focused on the big picture!

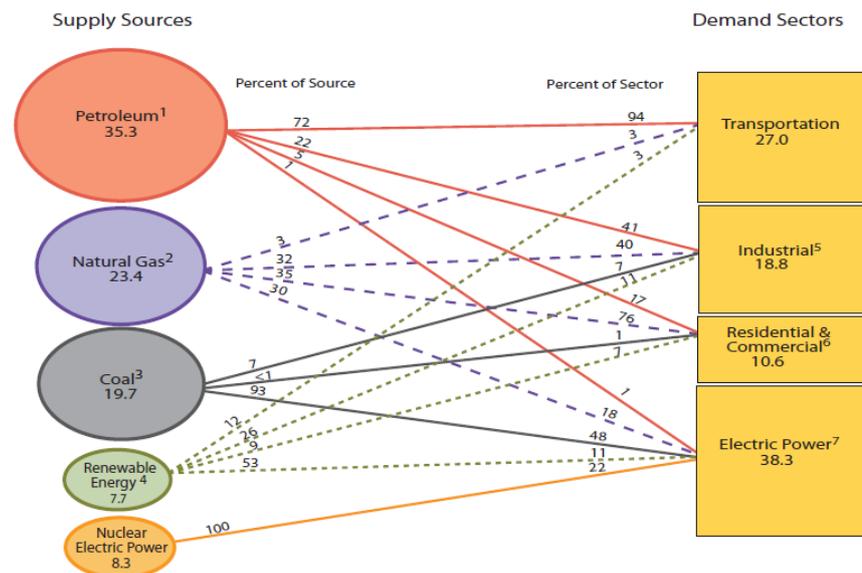
*Extreme fuel efficiency*

Earlier this year, at the Qatar Motor Show, Volkswagen unveiled a remarkable new car called the XL1 (see pictures [here](#) and more details about the car [here](#)), which is expected to go into limited production as early as 2013. The car runs on a 0.8 litre hybrid engine (combined TDI engine and lithium battery) capable of carrying two people at a top speed of 160 km/h (100 mph).

The XL1 can drive an astonishing 110 km/l (313 mpg) and emits only 24 g/km of CO<sub>2</sub> in the process. As an added bonus, the car can do up to 35 km (22 miles) in battery mode, i.e. with zero carbon emissions. A lightweight body of only 795 kg partly explains the impressive performance. The car has been 13 years in the making and is by far the most fuel efficient car the world has seen to date.

Now, let's imagine for a moment that every private car in America could run 110 km/l (260 miles per U.S. gallon). The almost 300 million people in the United States go through approximately 20 million barrels of crude oil every day. 72% of that, or approximately 14 million barrels, go towards transportation (see chart 3).

**Chart 3: U.S. Primary Energy Flow, 2009 (quadrillion Btu)**



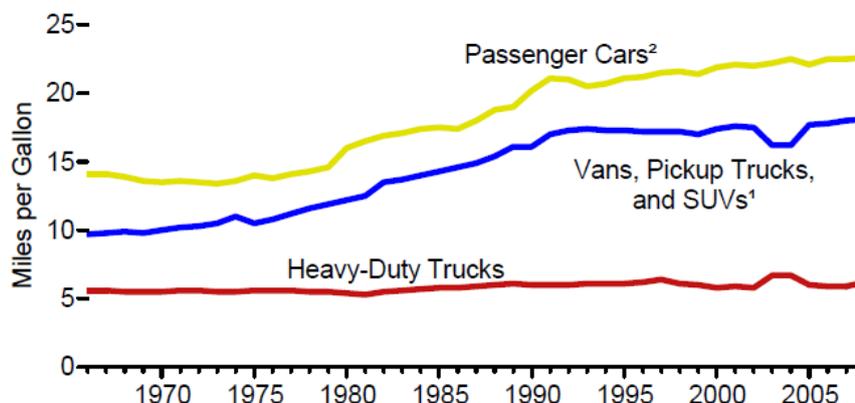
Source: [http://www.eia.gov/emeu/aer/pecss\\_diagram.html](http://www.eia.gov/emeu/aer/pecss_diagram.html)

Of those 14 million barrels, 8.5 million are turned into petrol each and every day. Most of the rest is used for diesel and aviation fuel. Now let's assume that all private cars on American roads use petrol - not an unreasonable assumption, as few private drivers in America have taken a liking to diesel. Let's also assume that the average private car in America does about 20 mpg (seems reasonable given chart 4 below).

If every private car, SUV and pick-up truck in America could do 260 mpg (which of course is completely unrealistic in the short to medium term), the 8.5 million barrels per day of crude oil used by private drivers could be reduced to less than 1 million bpd, equivalent to over \$300 billion of annual savings, or 2% of GDP.

The point I want to make is not that this is necessarily going to happen anytime soon, but that it is in fact *extremely easy* to dramatically reduce the consumption of crude oil in the United States today, so long as there is a political will to do so.

**Chart 4: U.S. Fuel Efficiency**



Source: U.S. Energy Information Administration

If you then carry on the same thought process, assuming that the rest of the world is twice as fuel efficient as the U.S. economy, a quick back-of-the-envelope calculation suggests that daily oil consumption in the rest of the world could be reduced by 18-20 million bpd in addition to the 7-8 million saved in the U.S.

Now, a two-seater is not an appropriate car for every Tom, Dick or Harry. Mums on school runs, taxi drivers and bigamists are amongst those with different needs but, based on the number of cars I see every morning with one person in them going at 30 mph (at best) through London's congested rush hour traffic, there should be a significant market for a car such as this one. Let's say for argument's sake that a two-seater would suffice for one-third of all drivers in the world. Oil consumption could then be reduced by 8-9 million barrels per day in one swoop, not to mention the dramatic reduction in CO<sub>2</sub> which would follow.

It is probably also fair to say that to many, a two-seater hybrid which can 'only' do 0-100 km/h (0-60 mph) in 11.9 seconds would be a step down relative to the gas-guzzler they currently drive (I include myself in this category), but this is where political leadership and, if necessary, legislation comes in. The EU has recently decided to ban all conventionally fuelled cars from city centres across the EU beginning in 2050<sup>3</sup>. The decision raised the predictable storm of protests, but the key is in the wording. Cars will not be banned altogether, only those using conventional fuels.

#### Hydrogen

Improved fuel efficiency is by no means the only way forward. Hydrogen has been on the radar screen for years as a possible future source of transportation fuel, but the dangers involved in the handling process have meant that highly sophisticated equipment (high pressure tanks) were required to make it safe. Now that problem appears to have been overcome – a new technology developed by a UK company called Cella Energy allows users to pour hydrogen into the car's fuel tank in very much the same way as we pour petrol into our cars today<sup>4</sup>.

Hydrogen carries many advantages. It has three times more energy than petrol per unit of weight and, when it burns, it produces nothing but

<sup>3</sup> Source: <http://www.telegraph.co.uk/news/worldnews/europe/eu/8411336/EU-to-ban-cars-from-cities-by-2050.html>

<sup>4</sup> Source: <http://www.telegraph.co.uk/finance/newsbysector/energy/8379357/Hydrogen-fuel-for-cars-comes-a-step-nearer.html>

water. It is estimated that we could reduce carbon emissions by 25% if everyone switched to hydrogen based transportation fuels. And the UK government, which badly needs the £26 billion it rakes in each year from fuel taxes, could earn the same duties, if hydrogen sold for 90p per litre at the pump versus the £1.35 that we currently pay for petrol. It would obviously take time to scale up the production, but Cella Energy reckons that it can start production as early as 2013.

*Fast charging batteries*

Electric cars have been around for a while, but only hybrid cars have achieved some measurable commercial success, mainly because the battery technology is not yet good enough for the pure thing to take off. That may be about to change. Researchers at University of Illinois have made a break-through in terms of speeding up the charging process to the point where it is no longer unrealistic for the re-charge to take only a couple of minutes – about the same time as it takes to fill up your car with petrol or diesel<sup>5</sup>.

Now, that poses its own set of challenges. For example, electric systems in cars as we know them today are not strong enough to cope with the dramatic increase in amperage that the car would be exposed to, but such problems can be overcome.

*Power beaming*

Power beaming is a laser technology used to beam electricity into space. This technology sounds very futuristic, but tests have recently been completed where the flying device was kept in the air for more than 12 hours<sup>6</sup>. The first application is likely to be military, such as the unmanned drones used by the US military in Pakistan and Afghanistan (most drones run on battery power today and thus have a strictly limited range). The technology also offers great commercial potential. Airlines could over time switch to electric power beamed to them from earth. Such technology would greatly reduce the demand for jet fuel, which absorbs about 10% of all crude oil demand today.

*Thorium based nuclear power*

Now to a more controversial idea, following the tragic events in and around Fukushima. Whether we like it or not, nuclear power is very much an integral part of European energy policy today with 30% of all electricity produced by nuclear power plants. Nonetheless, it has never been more unpopular. Few people trust that nuclear power is safe, and the recent disaster in Fukushima has not exactly improved that perception. At the same time, the vast majority of those that I have challenged on the subject confess to never having heard of thorium.

Thorium is a silvery metal, abundantly available throughout the world. What makes thorium different from uranium is that it must be continuously bombarded with neutrons to stimulate the fission process. Unlike uranium, thorium is not radioactive enough to sustain the process of its own accord. Hence a thorium based nuclear power facility is not dependent on electric power the way a uranium based facility is. The moment the power is cut off, the fission process stops by itself and a Chernobyl or Fukushima like meltdown is therefore not a possibility. A built-in safety feature so to speak.

There are several other benefits to using thorium instead of uranium. A thorium based system operates at atmospheric pressure, so the explosions we experienced at Fukushima would not occur at a thorium based plant. Furthermore, the amount of hazardous waste is about 1/1,000 that of a uranium based facility. Last, but not least, there is so much thorium in the earth's crust (and in friendly hands), that we could produce cheap and safe electricity for thousands of years.

Sadly, despite the UK having been at the forefront of a global research initiative on thorium as a safe alternative to uranium, the government

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<sup>5</sup> Source: [http://www.economist.com/node/18437910?story\\_id=18437910](http://www.economist.com/node/18437910?story_id=18437910)

<sup>6</sup> Source: <http://www.economist.com/node/18304136>

has recently cut the funding as part of its austerity plan<sup>7</sup>. At precisely the time you need strong political leadership to secure future energy supplies, our political leaders choose instead to chicken out and opted for the easy (but economically stupid) solution – cutting funding on productivity enhancing infrastructure projects and spending it instead on vote-winning transfer payments to the poor, where the multiplier is near zero. They deserve an F for leadership and vision! Instead, India and China are now considered the leaders in this field, given them yet another advantage they don't really need, if we wish to compete with them at the global stage.

#### *Algae Oil*

Bio fuels offer a long history of politically motivated, and financially inept, decisions. However, there is light at the end of the tunnel. Algae provide the first realistic opportunity of producing bio fuels on a large scale and at a competitive price (at least at current oil prices). Algae are amongst the most rapidly growing plants in the world, and almost 50% of its body weight is made up by oil.

This particular feature make algae a very attractive alternative to more traditional bio fuels such as corn, soy beans or sugar. Whereas a corn field measuring one acre will produce approximately 30 gallons of oil per year, the same area can produce 100,000 gallons of oil if algae are grown instead<sup>8</sup>. And, unlike corn, ocean or waste water can be used, preserving our precious fresh water supplies. One very interesting statistic to support the case for algae based bio fuels comes directly from the United States Department of Energy:

*“If algae fuel replaced all the petroleum fuel in the United States, it would require 15,000 square miles (39,000 km<sup>2</sup>) which is only 0.42% of the U.S. map.”*

#### *Conclusion*

I don't really have any idea which of the new technologies will prevail and which ones won't. But I am dead certain that at least some of them will - and within the not so distant future - and for that reason I believe oil is nearing its end of worldwide dominance as the primary source of fuel for transportation.

This in no way implies that I am now forecasting oil prices to drop to \$30 within the next few months. In fact, oil prices could quite possibly go higher near term - potentially much higher, if the situation in the Middle East worsens.

However, the more research I do on alternative energy forms, the more convinced I become that a substantial part of the 55 million barrels of crude oil the world needs for transportation each and every day will be substituted over the next few years. Why? Because we have no choice. Six billion people will soon become seven and then eight or even nine. And they all want our life style.

So, when Jeremy Grantham states that we are in the midst of a paradigm shift, I agree. But I don't agree as to what that shift entails. Like Dylan Grice, I am optimistic on behalf of mankind and believe that ingenuity will ultimately see us through this crisis. Winston Churchill once said: “Americans can always be counted on to do the right thing - after they have exhausted all other possibilities.” I believe the same logic applies to our political leaders.

#### **Post Scriptum:**

The same Tricia, who runs marathons in between running our research, is currently holidaying in Vietnam. After having read the first draft of this letter, she sent me an email, making the following observation:

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<sup>7</sup> Source: [http://www.telegraph.co.uk/finance/comment/ambroseevans\\_pritchard/8393984/Safe-nuclear-does-exist-and-China-is-leading-the-way-with-thorium.html](http://www.telegraph.co.uk/finance/comment/ambroseevans_pritchard/8393984/Safe-nuclear-does-exist-and-China-is-leading-the-way-with-thorium.html)

<sup>8</sup> Source: <http://edition.cnn.com/2008/TECH/science/04/01/algae.oil/index.html>

*“This part of Asia has a long way to go before finding alternatives to oil. The roads are totally mad (as are the people on them) - chocca with scooters, which has all apparently happened during the development of the last 3 years.”*

She has a point. But for my prophecy to be fulfilled, I do not need the entire world to switch away from oil. All I need is for 20% of the approximately 55 million barrels of oil which go towards transportation each and every day to switch to alternative energy forms, and the world will reduce its daily consumption of oil by 10-11 million barrels. Trust me - that will have a profound effect on the oil price.

**Niels C. Jensen**

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