GLOBAL RESOURCES ANALYSIS

SITUATION 2009

DRAFT VERSION

Publishing Name Commercial Version: Limited Supply

ISBN 978-94-6012-002-2

Both the Global Future Analysis report and the Global Resources Analysis report can be downloaded for free at www.planck.org/downloads. Build on the information/conclusions gathered for these 2 Analyses Planck Foundation is creating 12 Generic Models that can lead/support governments/companies in initiating actual needed changes: the Action Model, the Communication Model, the Localization Model, the Production Model, the Mobility Model, the Transport Model, the Currency Model, the Privacy Model, the Peace Model, the Political Model, the Knowledge Model and the Finance Model. Planck Foundation also will develop a wide set of digital communication based Facilities to support both the exposure of the Analyses and Models as the local/regional/national and sector/technology focused initiatives.

It has been said that there are three types of people:

Those who make things happen.

Those who watch things happen.

Those who wonder what happened.

Describing the rapidly changing global economic landscape with many market polarity changes caused by

increasing global demand, stabilizing/declining global supply and higher exploration/production costs.

Analyzing possible action points that could slow down economic decline and soften the economic impact.

Both the Global Future Analysis report and the Global Resources Analysis report can be downloaded for free at www.planck.org/downloads. Build on the information/conclusions gathered for these 2 Analyses Planck Foundation is creating 12 Generic Models that can lead/support governments/companies in initiating actual needed changes: the Action Model, the Communication Model, the Localization Model, the Production Model, the Mobility Model, the Transport Model, the Currency Model, the Privacy Model, the Peace Model, the Political Model, the Knowledge Model and the Finance Model. Planck Foundation also will develop a wide set of digital communication based Facilities to support both the exposure of the Analyses and Models as the local/regional/national and sector/technology focused initiatives.

You need to understand Currency, Credit, Minerals, Energy and Water.

Watching the News without some basic knowledge of those five is useless.

Knowledge of those five make History, Present and Future clear to you.

Food = Soil + Carbon Energy + Water.

Economy = Production + (Currency * Credit) – Cost (Minerals + Energy + Water).

Wealth = Economy * Geopolitics.

"What people need to hear, loud and clear, is that we're running out of energy in America."

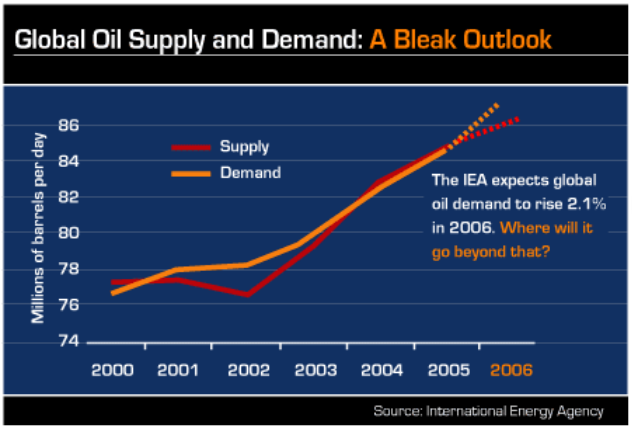
May 23, 2001
George W. Bush

MANAGEMENT SUMMARY

PeakOil: the moment that we've taken out half of the oil that was out there, we're stocked with only the lower grade and much more difficult to explore rest. A era where the times of cheap and abundant oil driven economy are over for ever. A time of severe growth of demand, but declining supply, lower qualities/grades, expensive exploration, and higher prices by these four, beyond limits shortages, huge regional and geopolitical tensions.

Undersupply of everything we need, and oversupply of shortages. Is this situation this our outlook? Let's not hope so. But a 50% more energy demand in the next 2 decades by rapidly declining energy supply the same time is a fact and had it accelerating consequences on the prices of energy for our economies.

The big question is: How to turn on the Peak Oil Caused Crash Armageddon Scenario into a Post Carbon Good World Scenario, without the chaos caused by shortages and by explosive price rises. How do we're able to produce food and create prosperity to all currently 6.7 billion and future 9.0 billion people on earth?



This gap between supply and demand is not a future scenario, but is actually happening and growing since 2005. The gap is still relatively small, but will become more wide year after year, and will cause the logical attached price rises and supply interruptions.

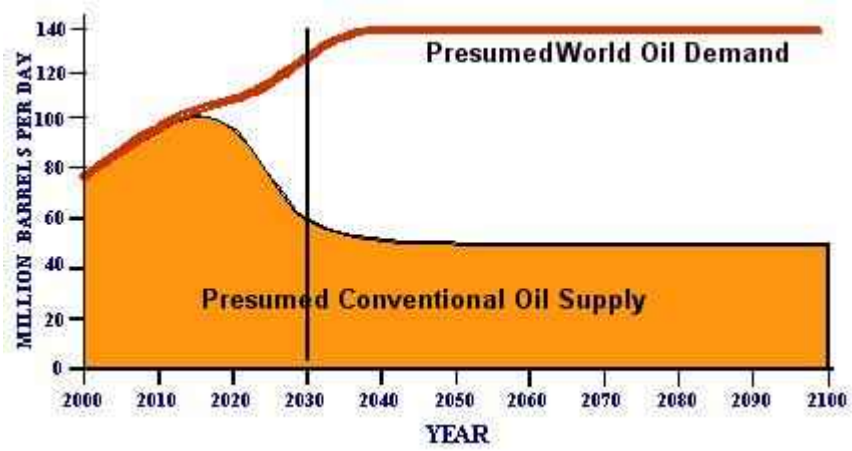
This analysis is no third world story. As you can read in this analysis, it is happening right now and the chance that the so called first world, by her energy deficiency, will become the third world of the world has become a realistic possibility.

Can full prosperity (housing, food, water, energy, mobility and luxury) for every-body (us and others) be realized in PeakOil times and what does it takes? Let's stop hoping that others will do it and start analyzing, searching for new ways, designing solutions and acting.

Knowing the situation. Avoiding the spills. Seeing the advantages. Designing solutions. Financing the solutions. Realize transition. Realizing new capacities. Changing economic models. Solving the problem. It can be done.

The size of the world population we can not steer, the prosperity demand of the world population we can not steer, the size of the natural resources we can not steer. The facets we can steer are technology, organization and capital. And as world community we are good in all these three. Very good. We need renewable energy capacity, both remote and domestic. We need financial structures to finance these investments. We need to change business models and production processes.

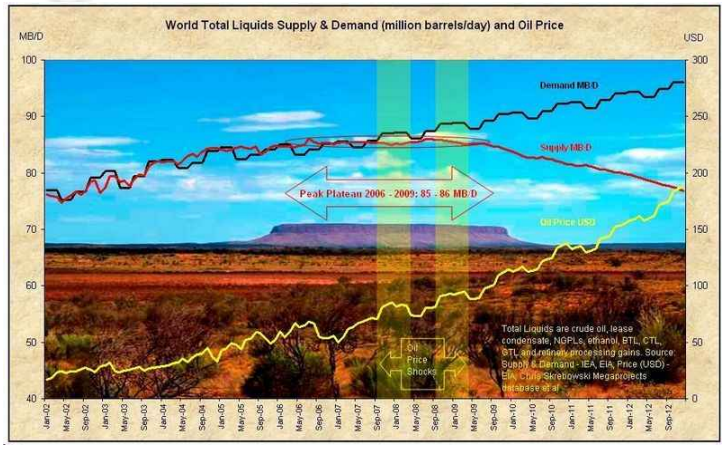
The analysis will give you seven simple conclusions (you probably already know if you're familiar with the actual global resources information): 1) The global resources situation (and certainly the global energy situation) faces a very difficult nearby future, more severe than commonly known at this moment, which will certainly hit our cheap fossil energy based/fueled economy severely. 2) We can avoid this major treat to prosperity by a huge energy transition process of a) generating huge new energy capacity and b) transite our economic processes and our fossil energy using installbase -like cars-). 3) The current and future price of energy and new technology has made huge renewable energy cheaper than fossil energy, which will boost renewable energy generation from out the whole economy, to levels we've never seen before. 4) Local wind and local solar power will be everywhere, feeding domestic needs. 5) Cities and industries always are energy deficit and therefore needs large amounts of off-location energy. 6) Super sized windmill parks at sea and huge concentrated solar power parks in the desert will be realized in the next years. 7) Supplying regions will be connected with the demanding regions by the new type of HVDC power infrastructures.



The finance model will give you information about a global model for instant huge energy investments (both large central, as massive decentral) in large numbers worldwide for the total amount of one year world GDP. In a model that is realizable in a severe by subprime caused down writing hit financial market. It's based on a combination of backwards guarantees, forwards guarantees, specification focused fixed amount tendering and performance bonds, all covered with governmental and commercial insurances.

What amount of investments is needed? Let's calculate simple. How big is the global fossil energy (and connected) commodity market (without derivates like anything we make from fossils)? Global daily oil consumption is 85 million barrel a day, at $ 117 end product per barrel (crude, plus transport, plus refinery crack fee, plus storage, plus distribution costs, plus trade margins) is $ 10.000 million per day, and is $ 10 billion a day. Let's double this amount for calculating gas and coal reasons (fossil is 87% world energy market, oil 40%, coal 24% and natural gas 23%, so coal and gas together are the same size -a little more- than oil), that is $ 20 billion a day, is times 365 a year, is $ 7300 billion a year, is $ 7.3 trillion a year. Investments will need a least 10 years to earn themselves back (they will be mainly renewable, therefore is only the investment facet, not a fuel facet) is a $ 73 trillion investment need, which is roughly the current worlds GDP (GWP) of one year. Other calculations give a 2 year WGDP figure ($ 146 trillion) as the needed global energy investment amount (they calculate the replacement of the install base as the second half of this investment).

There are two external influences in this raw calculation model: 1) Higher oil prices, say doubled (it has happened half way in 2007, it can happen again half way in 2008) would literally double the investment amount in this model (we gone pay more for energy, a lot more, cheap energy is over). 2) More efficient renewable power generating technology can lower these investments severely. Imagining a 25% more effective technology, this should cut 20% out of the needed investments. Technological efficiency increase of this size are not possible, because both CSP generated power and wind generated power are well developed yet and based on old standard technologies. But price/performance ratios certainly can be developed much more further by mass production and install adjustment cost reductions. So in other words (as result of these two facets): above calculation is just a forward estimated amount calculation, just of a kind 'better than none'. Backwards calculated, the results of such a calculation will become proven facts. Above raw calculation is no more and no less than just some estimated investments defining calculation model.



Attached to each huge energy transition investment is an economic transition investment fund (funded by the sale of the energy investment contracts to financial

institutionals) of the same size as the huge energy transition investments. These economic transition funds are focusing on transition of the economic model to the lower energy using and carbon energy free model in which the capital intensive transition of install base (for example cars from gasoline to electrical) play a significant role. If the investments are made by the designed model, this economic transition investment funds could facilitate in risk capital for micro transition in countries.

The analysis will wake you up from denial of the global resources situation and make you active in finding solutions. The finance model will give the possibility of realization of the designed solutions. All to the financial model attached investment funds will fund local power generation by governments, companies and civilians.

Amsterdam, January 6, 2009 Gijs B. Graafland

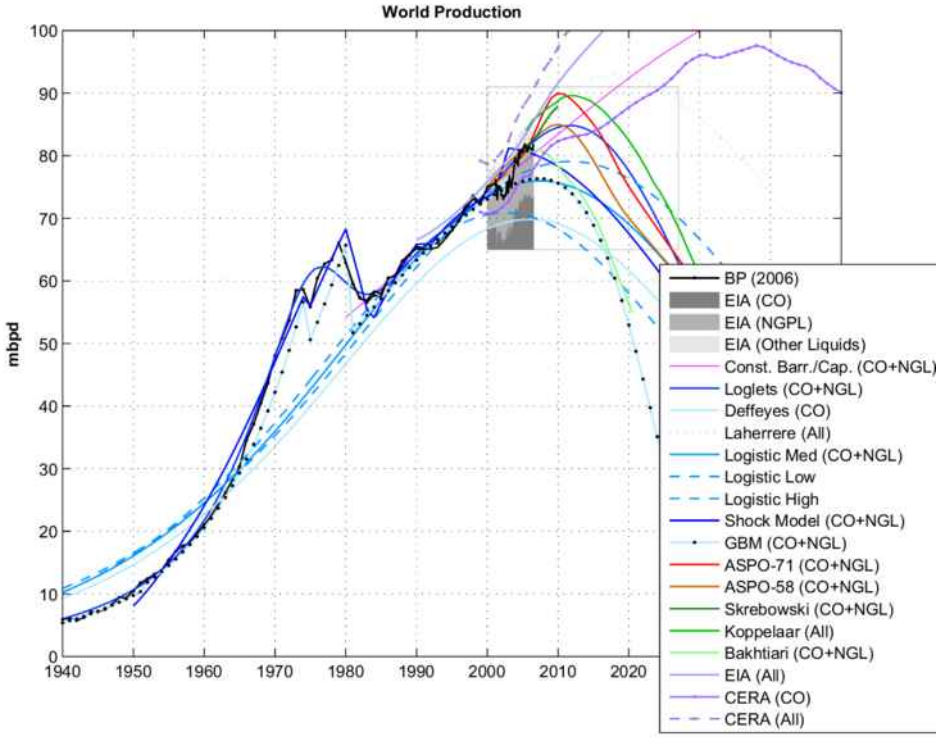
INDEX

Both the Global Future Analysis report and the Global Resources Analysis report can be downloaded for free at www.planck.org/downloads. Build on the information/conclusions gathered for these 2 Analyses Planck Foundation is creating 12 Generic Models that can lead/support governments/companies in initiating actual needed changes: the Action Model, the Communication Model, the Localization Model, the Production Model, the Mobility Model, the Transport Model, the Currency Model, the Privacy Model, the Peace Model, the Political Model, the Knowledge Model and the Finance Model. Planck Foundation also will develop a wide set of digital communication based Facilities to support both the exposure of the Analyses and Models as the local/regional/national and sector/technology focused initiatives.

We can put here some own text, or just let someone else with market authority do the talking for us. We have decided to go for the last option. It says better than we even can do what we want to say:

The statement of Mr. Jeroen van der Veer (CEO of Shell) concerning the world energy situation on the website of Shell: (http://www.shell.com/home/content/aboutshell-en/our_strategy/shell_global_scenarios/two_energy_futures/two_energy_futures_25012008.html) with the following main sentence "After 2015, easily accessible supplies of oil and gas probably will no longer keep up with demand."

The two conclusions of this captain of industry of a major energy conglomerate (if some knows the global energy situation he is) made are: 1) easily accessible oil and gas has come to an end (more expensive exploration costs will drive prices up) and 2) demand with outstrip supply quick and severely (and than market mechanism of less supply and more demand will drive energy prices up).



So double misfortune for each person, company and nations that consumes high quantities of energy (and aren't we all?). These two developments are already happening. In the year 2007 as the result of those two oil went +57% up and coal +55% up.

Or listen to Jeremy Bentham (vice-president Global Business Environment van Shell International): "The IEA (International Energy Agency: the world's leading energy agency) severely underestimate in her projections the huge energy demand of the beyond early expectations economic growth of China, making them far to positive concerning timing and impact of the gap between demand and supply." of "We can't get much further ahead in increasing supply."

The fact that Shell (by this current high oil market prices) her profits not mainly use for new oil exploration, but mainly use for giant purchase of own shares (often ironical mentioned as 'stock retirement') is a sign on the wall.

Or listen to George W. Bush (President of the USA): "I believe oil prices are going up because the demand for oil outstrips the supply for oil. Oil is going up because developing countries still use a lot of oil. Oil is going up because we use too much oil, and the capacity to replace reserves is dwindling. That's why the price of oil is going up."

Time for some further analysis, what is really the situation, what is really happening and what are the impacts of these three main facets (real shortages -as in: lack of supply-, and/or high prices due to less supply than demand and/or much more higher exploration costs for new -more difficult- explorations). What are the effects of high prices? Do we know the real energy cost facet of each product or service? And will there really shortages that even cut off current supply?

Time for finding new ways of dealing with these energy shortages (that threaten regular supply and will evocable happen when we don't find new energy solutions). And with continuous more and more expensive becoming energy prices (that increase all prices severely and will also evocable happen when we don't find new energy solutions). And for preventing the very negative effects caused by these high product prices caused inflation and maybe supply interruptions on our economies.

Time for cutting all non-sense talk about that there are no problems with both supply and demand, but just looking to the figures without any opinion.

Certainly time for cutting all non-sense perception talking about 'itself fixing' situations ('the issue will be automatically solved by the market when the time ask for it'). The energy demand is so huge, so major facet of prosperity, so too bound to install bases (for example: almost all current cars only can drive on fossil products), that when we not act now we're in serious trouble.

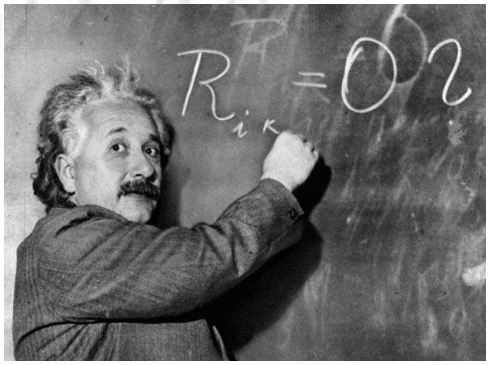
To close this introduction with quoting an other governmental authority: The US Department of Energy (US DoE) her energy sources and installbase transition report (widely known as the Hirsch Report: http://www.netl.doe.gov/publications/others/pdf/Oil_Peaking_NETL.pdf). "The world need 20 years to transite energy generation and devices away from fossil energy, if we want to do this without the extra headwind of an economic crisis caused by energy shortage (interrupted/unstable supply) and too high prices of the old fossil energy."

Conclusion: If we're now (and not 20 years from now) are in PeakOil, we'll face serious economic trouble (as in: shrinking economies due to expensive prices), and the difficult transition away from fossil energy than will go sided with huge and severe economic problems. When PeakOil has been happened is only to say afterwards.

As said: We gone pay more for energy. Not a little more, but a lot more. Cheap energy is over. These few simple words have a huge (beyond imagination) economic impact. Denial would not help us, it only hardens the shock (of first time out of supply) severely, and leaves us with less time and economic health for energy transition (sources and use both need to transform severely).

Therefore let's look forwards: There's today really some cleaver and hard work to do in energy transition finance and realization to maintain and spread prosperity, for all of us, otherwise prosperity will leave us in high speed.

Avoiding 'make believe' type of attitude concerning the global energy situation in any direction is crucial. Both now in denial (like in: there is no problem AT ALL), as later in perception (like in: this is un-addressable problem).



As Einstein has already told 80 years ago: Common believe is not common knowledge or actual and/or future reality. The future energy problem is much more severe as commonly recognized (denial is common now). On the other hand: the energy problem is more addressable than common sense tell you now. Explainable: after denial solutions will be designed.

Illustrating examples from other issues: The subprime market: Common sense was too positive, that lead to purchases and investments afterwards regretted and has made the shock more severe. Or the Iraqi War: Common sense about the WMD

was at that moment too negative, that leads to national decisions that were afterwards regretted.

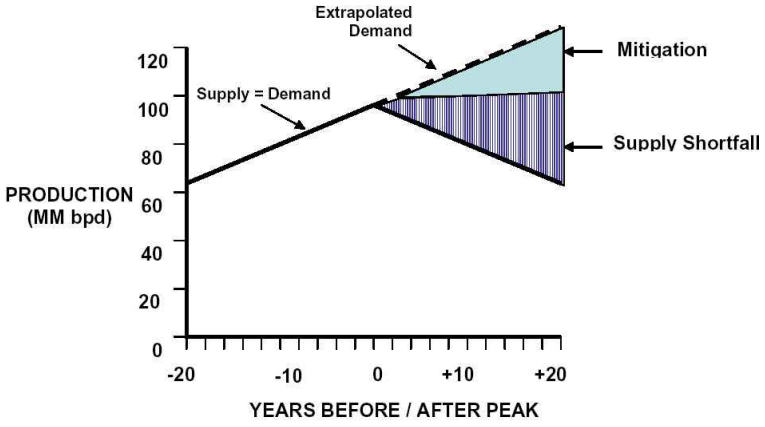
Be independent in your analyses, use common sense, and don't take it for granted. Common sense is one of the guideline lines, certainly not the best guideline. The current and future energy situation asks for actual analysis by everyone.

Like by all major events (personally and/or globally), the human mind goes through denial, protest/anger, negotiating, depression and finally acceptance (and yet after acceptance we are able to address the energy problem).

See this analysis as a trigger for your mind. It's not build as a traditional scientifically formatted report, otherwise the numbers of readers would be too small and too selected, and therefore you will not be bored by footnotes in this analysis. It is no more and no less than just a way your own mind can travel on. So question by yourself everything that written in it.

Make up your own vision/mind make up your own mind on PeakOil, its effects and/or dangers and possible solutions based on the Global Resources Analysis 2008. Because all things are related to each other, some issues are handled sometime in more subjects. They are sometimes influence factors, and sometimes influenced factors, leaving them unmentioned in the related subjects spare you some doublers, but would also harm your overall analysis.

Read, analyze, make up your own/corporate/governmental opinion and certainly act in line with that: The energy transition process both locally and globally need you, your brain, your skills, your experience, your network, your company, your bank, your government and certainly your action.



As said in the Management Summary: The size of the world population we can not steer, the prosperity demand of the world population we can not steer, the size of the natural resources we can not steer. The facets we can steer are technology, organization model, production processes and capital. And as world community we are good in all these four. Very good. We need renewable energy capacity, both

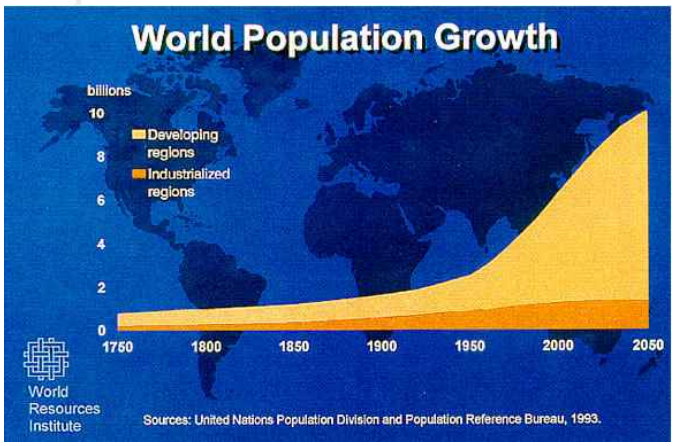
remote and domestic. We need financial structures to finance these changes and investments.

INTRODUCTION

There are two major global growth factors: the number of people on the earth and the increasing general prosperity status of all these people. The first important grow facet is the world population. The number of people on the earth is still growing. Birth rates still stay high in many countries, while death rates drop all over the world by increasing higher life time expectations. Based on most actual data projections the population growth will be stop in 2030 on approximately 9 billion people. More people generate automatically more demand for energy and other resources. The second important grow facet is the growth of the world prosperity. No longer only a small minority of the world population is wealthy, but by the economic wonder in Asia and South America it looks like the majority of the world population is growing to a certain state of prosperity. More prosperity generates automatically more demand for energy and other resources.

WORLD POPULATION GROWTH

So the number of people on the world still grows every year and probably will continue to do so till 2030. World population growth is the result of birth rates and dead rates. Recent studies conclude that the growth of the world population earlier stop than the first calculated growth stopping year 2050. This because it has proven to be true that as soon people get even some prosperity and therefore can afford birth control, the birth rate figures drop instant from population growth to population stabilization (the birth rate and dead rate become equal). In 1804 there were 1.0 billion people on earth, in 1927 this number was grown to 2.0 billion, in 1959 it has become 3.0 billion, as soon as in 1987 it has become 5.0 billion and in 1999 the number excised 6.0 billion. The counter these days (only 7 years later) show + 0.7 billion on 6.7 billion.



So the current grow speed is approximately 1.0 billion in 10 years, but as soon as birth control is available, population growth stops. After stabilization of the world population figure only nature, technology, peace, health, bacterial, virus caused

and economic disasters will effect these figure and one huge major other facet: the expected life time of people, its world average almost has doubled in the last 100 years from 32 years than, till 67 years now, but this still can grow further by still increasing medical science and more healthy sanitation/food-nutrition/life styles. Life is a positive facet, not only young strong adults, but also new births and elder people. Everybody has an equal right to live happy and long and to have children to share life with. Only negative focused, life's pleasure don't appreciating people think otherwise. People (and certainly children) are a very positive facet of our world: Life really can be beautiful for all of us. World population growth therefore is a good thing and will stop itself (stabilize in volume) by reaching general world prosperity. But more people on earth of course automatically increase the demand for energy and other resources. The world can handle global population growth: we just need to use bio technology and energy technology more smart.

WORLD PROSPERITY GROWTH

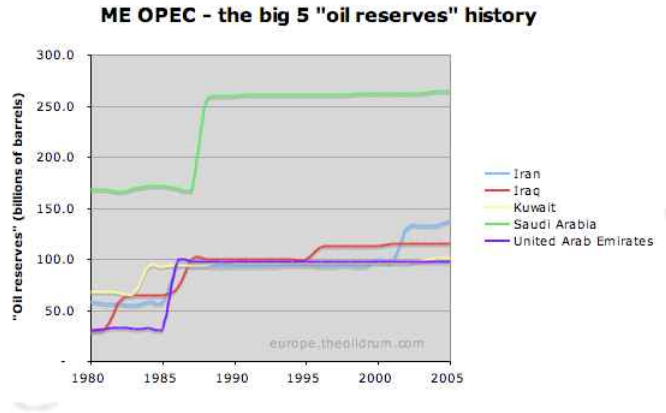
The wealth of the world population is still growing. In 2000 50% of the world adult population owned approximately only 1% of global wealth. This general poverty is changing rapidly by the Asian economic wonders of nations like China and India. Prosperity levels are rising very quickly in many nations creating not only a top wealth layer, but also a wide middle class prosperity. China is the best example of this development. Approximately 4.0 billion (more than 50%) of the current 6.7 billion people on earth live in Asia and the Middle East. Asia really has the last years several major economic (and also political) tailwinds by becoming the manufacturers nation of the world. The Middle East has had tailwind since their oil and gas wealth starts rolling from the '5oties. The wealth of these 4.0 billion people is growing each year. Their standards of living improve in terms of income and purchase power each year further.

These 4.0 billion people want the same wealth as people in the EU or the USA and they're right about this. Prosperity equals energy use. The demand for energy in a region rise enormously when prosperity grows in a region. Not longer is just a small part of the world population wealthy, but each month more people get increased prosperity. More global prosperity demand heavily more energy and resources. The world can handle growth of global prosperity; we just need to use bio technology

and energy technology more smart. The high energy prices are also an enormous transfer of capital from the nations of the Western World to some of the energy surplus nations of the Emerging World, giving them the purchase power to increase prosperity significant.

INTRODUCTION

The availability of resources (energy and elements) has given (and will furthermore give) mankind prosperity, by use of their intellect and the societal and technological developments fueled by that intellect. When mankind run out of irreplaceable resources, prosperity certainly will disappear, unless mankind is able to use societal and technological developments for recycling irreplaceables and creating replacements. From global economic perspectives it's strange that the global economy as a plane in flight fly with the absence of a well functioning fuel tank level indicator. This could be considered as 'not wise'. The OPEC proven reserves are not as proven as they are stated by their governments: In the years '83 till '90 all OPEC nations average almost doubled their proven reserves figures due the combination of their mutual agreement of quota's based on a certain percentages of their proven reserves they've negotiate with each other in the '70ties as a price level insurance. The only reason for this rare doubling inflation where the low oil prices of that period, which had lead to a sharply declined yearly income of all OPEC countries.



These for political reasons adjusted higher proven reserves figures can't be called 'really proven', but must be called 'politically caused proven' so that everybody know that they only are generate by theoretically increasing the possible output calculations of already existing fields. The reason behind the low oil prices in that period was both a some weaker world economy (just a temporarily 5% market oversupply by the market tendency influence) in the '80ties caused by the first Global Credit Crisis and also (later on) by the first an US/Saudi deal to harm the USSR export income severely as last and final phase of the Cold War by use of the so called extra 'swing' capacity of 5 million barrels a day the Ghawar Field had that days, which was by this deal used for market price manipulation, and the US paid the Saudi Government there losses caused by this managed over supply in weapon price reductions. This is the reason why Saudi Arabia was the last OPEC member that increased their 'proven' reserves numbers: to make the market supply that was needed for the USSR bankruptcy push possible within OPEC norms. The low prices period ended overnight when the US invades Kuwait to redraw the Iraqi

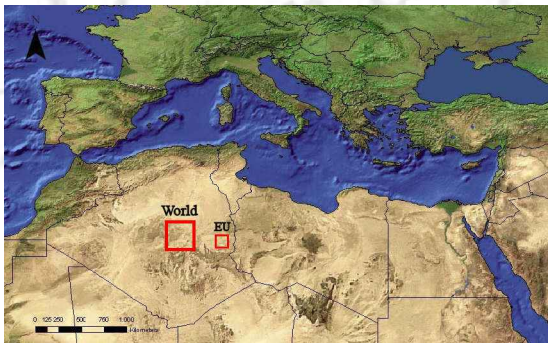
Army back to their own borders. The low price of $ 12 suddenly grows to $ 40 levels and never went down to the low '80ties levels again.

FINITE RESOURCES

As even in 2008 the world economy is heavily addicted (as said in 2006 by G.W. Bush, President of the USA, in his State of the Union) to the use of many finite resources. All of these finite resources run in increasing high speed out of supply by both the world population growth and the world prosperity growth. Many finite resources can be replaced by replaceables, but if the replacement resource also is finite it only buys some extra time and result also in running out of the replacement resource. Therefore of course it's better as soon as possible to replace finite resources by renewable resources. The reason why direct massive transition to renewable resources just is started is that economy (and no other facet) is the main drive behind finite resources replacement by renewable resources. The transition process away from finite to renewable will only be started as the finite resources reach that price levels that renewable resources will become cheaper.

RENEWABLE RESOURCES

Renewable resources become very attractive in times of shortage of finite resources. In terms of availability, pricing and guarantee of both these facets. The sun will shine and the wind will blow. There is no additional fuel needed, which supply can be stopped or price can be lifted. This makes renewable resources very attractive these days (2007: oil +57%, coal +55%, first month 2008: coal +20% again, due heavy rain in production area's and due that some net exporters has become net importers).



The large red area's on the map shows the CSP (Concentrated Solar Power) desert space demand in the North African Sahara to power the whole earth based on current electrical demand (so without the huge demand if we change to electrical cars), the small red square is the space needed for current EU power demands. It's just the investment and after that the sun or the wind power the facility day after day without daily fuel cost for free. This make business cases for renewable resources very attractive: demand is certain, investments are certain and operational costs are certain: certainness all over: making renewable resources business cases to the most beautiful business cases in the economy: investments and costs are fixed, income never lower than the current business case level and even

become higher each year. Not Al Gore and the Climate Change discussion, but the current and future more energy demand than fossil energy supply, will take care for a major rollout of renewable energy facilities.

ENERGY RESOURCES

The first resource mankind heavily depend on is energy. More specific: fossil energy, which is 87% of the global energy market. Everything we do and buy is based on energy. Even something not as fossil as fresh food. For each calorie of food consumed in the USA 90 calories fossil energy is used (globally average 10 calories). The world is using a lot of energy and each year this figure rise more and more. Logical to explain with a growing world population and growing world prosperity. Two developments that really push global energy demand each year further. We don't know the energy price component of each product/service yet. Knowing the energy price component of products/services was not necessary in times of relatively cheap energy prices. Our energy use has evolved from the cow we used in agriculture to more easily plough the soil, till jet engines that bring us to the other end of the world. We use so much energy, we even not know how much, but products/services prices will tell us that exactly the coming years. We are energy. Our life is fully based on cheap widely available fossil energy. Our lives will change dramatically when higher energy prices become clear in product and services prices. Up till now (start 2008) energy resources are almost just equal to fossil carbons (with just a small role for nuclear energy). Fossil energy issues have become a global issue. First by the Climate Change discussion, but this CC discussion become more and more overruled by the PeakOil, PeakCoal and PeakGas discussion, also know as Latest Carbons or Post Carbon discussion. Because the world energy demand over strip the world energy supply, fossil energy prices has rising +57% (oil) and +55% (coal) in 2007 and coal has only in the first month of 2008 another +20% added to her prices.

And this rise will continue: China only is currently building 500 new gigantic coal to power plants, each day the car fleet of China is rising severely and they all need once or several times a week a full tank of gasoline. Energy is becoming more and more expensive. Beside these huge demand rises: Cheap carbons (oil/coal/gas) are running out, giving first severe higher prices, later with additional only good

relation deliveries, till all resources are used. Energy is the main facet of prosperity: put this in one powerful line: above inflation level rising energy prices, give automatically less prosperity. Energy gets the weekly headlines because our energy consumption is so huge and every product/service we use (till the food we eat) has a high energy part of the cost price. With the current high energy prices of oil/coal/gas transition away from carbons to renewables has become much more too very easy. As earlier already stated: transition away from finites to renewables only happen when the fossil finites overprice the new renewables. This has happened in the last part of 2007 for oil and is still (more extreme) happening for coal in 2008. The sun and the wind can deliver us power against severe lower costs than the new oil and coal prices (don't calculate on old data based on old prices). Hydro carbons still rise monthly in price, renewables still lower monthly in price, making renewable energy each day more economic and carbons each day less attractive. To harvest the renewable climate based energy of sun and wind we need investments. Solar energy and wind energy are no longer by alternative businesses dominated sectors of economy. Solar energy and wind energy will become two main industrial sectors, just look to the daily energy expenses/budget of the world. Solar energy will mainly appear in two forms: Concentrated Solar Power (CSP) in deserts (mirrors that heat a transport fluid which concentrated heat is used to generate power) or Photo Voltaic (PV) on houses and buildings (the blue panels we all know). Wind power will also mainly appear in two forms: Tower Based (huge, high, standalone or in park collections) and Roof Based (small, very quiet, more designed). By use of CSP technology in only 1% of the Sahara can power Europe, Africa and the Middle East completely during day time. Night time power (always has been cheaper than daytime power), will be severely more expensive than day time power. The power will be transported from the Sahara by new to build High Voltage Direct Current (HVDC) infrastructures. To replace the current enormously energy consumption demand of the world by renewable capacity and realize also the here fore needed HVDC infrastructures is one of the greatest challenges mankind has faced ever. The world energy consumption (and therefore budget) is so gigantic that words can't express this and figures display such a numbers that they don't speak into today reality. Wide scale realized technology can replace fossil energy and make global energy resources almost complete renewable. Of course the decentral solution is the best solution (centralization gives always additional risks), but also huge parks and (more imported) connecting infrastructures can be designed against failures and attacks. But from geopolitical perspective the local/decentral option give the best insured independency. Technology and finance will help us to ensure our further energy demand, and yes, energy will be higher priced in the further, than it was in the past. Mobility (cars/planes) is one of the things that we do that consume maybe to much energy to maintain by the much more higher energy prices in the future. And if we switch away from carbon energy, we not only need new power generation but also a complete new install base. Cars that run on fossil fuel can't run on power, therefore there is a complete new global fleet of cars needed. Transition away from carbon is such a giant operation that it only will be done driven by economic reasons. Energy resources can be made easily renewable.

WATER RESOURCES

The second resource mankind heavily depends on is water. In the western world water has been long time (up till now) something people took for granted. This is changing. A growing list of cities in the Western World has reached their maximum water capacity. Climate Change can cut off entire cities from their current by rain feed water sources, causing major economic damage. In China there are already cities that have grown beyond their water capacity maximum. Only a small part of the water that is used, is used for drinking purposes: cleaning, sanitation, gardens also needs a lot of water.

Agriculture (major) and industry (huge) uses also large amounts of water. Without enough water we should have a completely different society. What is enough water? As much as we can afford? Or as much as we need? Or as much as we want. Till now in the western world the last option is our perception. Water can be used more than once, can be recycled by storage and purification. Beside energy there is no better example of the possibilities of renewal use of resources by use of technology than by water. Water production/purification also takes energy and therefore will be more expensive in the year to come. Water will be shipped over the oceans (like oil now is done) and than carried in pipelines to water deficit cities.

ELEMENT RESOURCES

The world is used to get the for production needed elements at demand driven prices. By the huge increasing global demand resources caused by the enormous population growth and the steady growing level of global prosperity (both caused by the emerging markets) there is a market polarity change. Markets become supply driven, this increases element prices enormously. Elements are finite resources. Like by oil: the easy to explore reserves began to decline and run out. More expensive exploration is what ahead of us, increasing the prices severely. But the major change will come as the elements market polarity change will totally completed: Than suppliers will only sold the volume they want to supply to the market (and by the finite characteristics of their element reserves that will certainly not be in the speed the market desires) and by this designed limited supply the prices of elements will increase severely.

SOIL RESOURCES

The world is big enough to support 10 billion people. In a global view soil is not scarce. Soil is only scarce in over populated areas. The world is not overpopulated, some local regions are certainly. People who think that the world is overpopulated are living in overpopulated cities and has traveled to less to other countries (where you can travel days without seeing anybody) and this narrowed there overall view. Basically soil is a not scarce resource, but soil quality is certainly a scarce resource that needs attention. Soil can be polluted by polluting type of industries and be polluted and pored by intensive monoculture based agriculture. Soil quality is certainly a huge resource for the world.

IPNUMBER RESOURCES

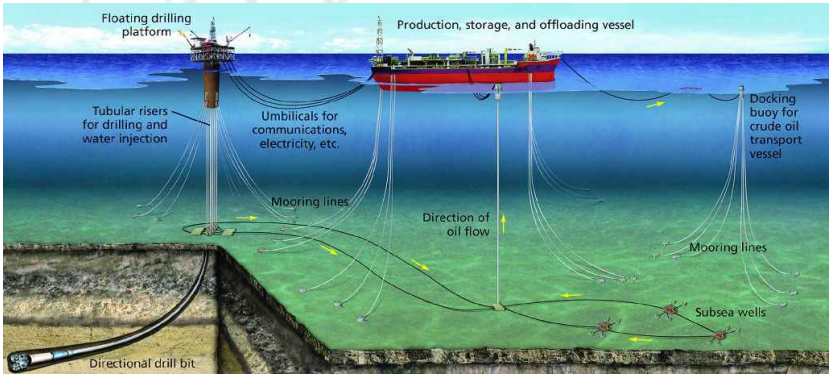
Each device on the internet has its own IP unique number. The current IP4 space in internet technology will be used fully within 2 years. The main reason behind this suddenly enormous demand for IP numbers is the tremendously growth of internet (http://www.ip2location.com/ip2location-internet-ip-address-2008-report.aspx) in China. Is IP6 there each cellular/mobile phone will gets its own IP number (necessary for videocalling, which will be peer to peer handled) and telco providers will get a new role (just being wireless layer delivering companies, with as much additional services they can sell, but customers who will act mostly independently - more peer to peer model focused- to their wireless layer provider). The worlds IP number space can be widened by use of the IP6 protocol (16 characters: x.x.x.x.x.x.x.x.x.x.x.x.x.x.x.x) instead of the IP4 protocol (4 characters: x.x.x.x). The IP4 to IP6 switch is a good example that major changes only will be executed when it's needed and not a day earlier, that's the way things go, on micro level and also on macro level.

INTRODUCTION

There are limits to many facets of the today's (totally on cheap carbon energy based) economic/societal model. Limits we don't like, rather not want to see, but really are there and when we reach them we are forced to see them and we will deal with them. With all the damage of seeing them too late. It's like a 24 hour store that suddenly closes on 18.00 hours for several days and where everybody suddenly must go in and buy for both today and the days to come.

RESOURCES LIMITS

Resources are the elements and energy that our planet has formed in millions of years, and that are exploration able by us here and now. By their millions years period of forming, it's very clear to everybody that it's a fact that these resources are finite at least sometime in the future. This is the most important problem of resources: they're all irrenewable and we can use them till they (in terms of economic -is relatively easy- exploration) are run out and than they are no longer available (or only by severe higher exploration costs). Resources problem number one. There is only a certain volume present (and that is the case by resources), there is no growth in this (and that is the case by resources: it takes millions of years to form them), the new recoveries are slowing down in high speed to always zero (and that is the case by resources) and there is a major write down on discoveries of the past by too positive projections and by too expensive or only partial possible exploration (and that is the case by recourses). Each of the above facts has a major impact. Therefore the current and future supply of resources is under an increasing load of pressure. Problem two is:

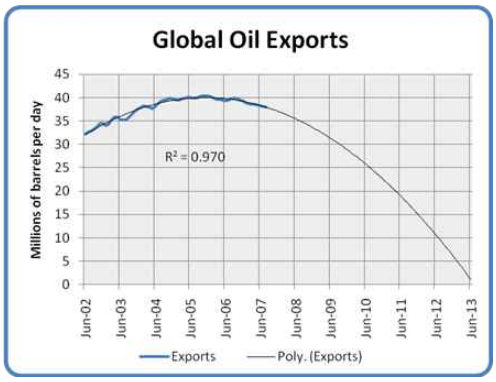


By the suddenly fast increasing global prosperity (which literally nobody has expected that it would happen so quick in mainly Asia) the process of using the available resources has speed up severely by this strong increasing demand out of the emerging countries. Hereby by the end of many resources has suddenly come in substantial speed forward. This has had a major self-enforcing/self-esteem impact on resources rich nations. They are the ones that know the resources situation the best. They are 1) scarced by this high speed depletion of their national

resources and want to use the income of their resources as long as possible to develop their countries to sustainable prosperity 2) sees that increasing production only lead to less better prices current and future prices and also lead to a much quicker depletion of their natural resources. These two major facets/emotions are the reason they almost all have nationalized their resources. An example: in the '70ties the Oil Big Five had more than 70% of the proven global resources, today their market share has declined severely, today they own only 10% of the global proven reserves, without there was any significant huge new discovery that has entered the market, and even this 10% is continuous under high pressure by new origin state taxes, that doesn't allow them to take them the full profit of these 10%. Their profits are huge due to high oil prices and less investments, but their market share is dropping each year. When in times of high market prices and huge profits, profits not are used for new explorations, but for re-purchasing own stocks (ironically named: stock retirement) you know that their dominant role of the past is over. And the new (origin countries based) players, doesn't stay home, they enter offensive the world markets: Even Gazprom want to buy or build a consumer gas brand in each Western European country. PetroChina is growing gigantically in many African countries. The high market prices these days are formed by the (technological) limiting supply by the origin nations. These nations have taken over the market and the twilight zone between the old and the new situation is a situation of under investment. Conclusion of all of this: regarding global resources there is a situation of higher costs of exploration, less supply by more difficult exploration, combined with more demand. These three facets that will take care of never seen high prices for resources (energy and elements). Elements are the real issue, they are really finite. Energy can be generated renewable.

EXPLORATION LIMITS

The rate of exploration is limited by exploration facilities. The call for more supply from the buying nations is not answered for the two above mentioned reasons (current income is good and more supply will not give more income, rational governmental decisions on nationalized resources), but also mainly for one extra reason: there is just not enough capacity. The clearest example for this is coal. The price of coal is going to the roof by the increasing demand (caused by both world population growth, world prosperity growth), but de demand for coal rises double by high oil prices, which had lead to phase out the oil to power and gas to power plants in favor of coal to power plants. Production capacity is the main problem. Otherwise many resources rich countries had chosen to increase production severely, because governments are globally wide known of their focus on addressing today and lack of taking care of the future facets. The production capacity doesn't match the market demand, building new production capacity is having here and now less budget for spending (no government likes that concept).

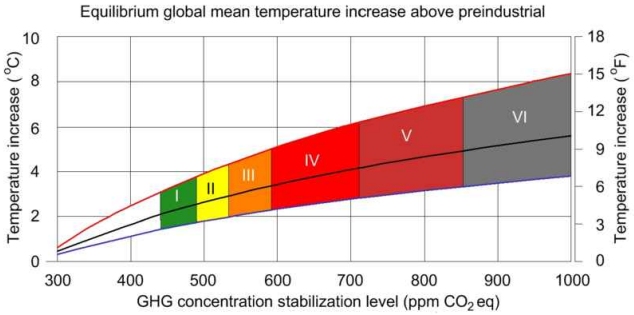


Russia is peaking in 2012, they don't see the need for pull this yet earlier by increasing actual world demand (and supply the market for lower prices now and being not able to benefit of the higher prices than). Exploration limits are also caused by the market polarity change. The big five saw that the origin countries will take over the ownership of reserves (Exxon > Venezuela, Eni > Kazakhstan, Shell > Russia, etc) are therefore has invested very carefully. Some origin countries has done this bold (Venezuela) and finding themselves now globally in severe juridical dire straits, other has done that smart (Canada by special taxes, Russia and Kazakhstan by juridical very clever designed totally re-opening contract negotiations or executing contract penalties). This twilight zone in ownership of course has leaded to under investment by the Big Five Oil Majors. And the 'new' owners (origin countries) invest very slowly: they aren't in a hurry to put their last resources against lower prices by higher investments to the current or near future market, they have capital enough, but they see very clear that this unique opportunity of exploration of natural resources is a very limited event. Within 5 years China will face the same issues in Africa as Shell has faced in Russia: contract re-openings that bring the market polarity change in all the contracts China these days has closed in Africa. The demand side definitely has lost in the market game of global resources. Having natural resources is equal to having (or getting soon) the chips at the board game. The exploration limits are facts. The growing use of the production nations also. By both equal level staying exploration and by declining exploration: exports will be each year severely lower than the year before. An extra market tightening facet is that domestic demands grows in accelerating speed in all production nations, leaving severely less volume available for export due to the exploration limits.

ENVIRONMENTAL LIMITS

There are certainly environmental limits, both locally and globally. That there are locally environmental limits we can see clearly these days in China. In almost none Chinese city the sky can be seen by air pollution. For the 2008 Olympic Games in Beijing, the Chinese government will shut down industries temporarily in the game area's just to fix this (and also the water shortage) problem for the Games period, because power is in China mainly generated by old inefficient not clean coal to power plants (and also because China has severe power capacity generating problems). Also is coal still a domestic heating resources and domestic heating by

coal is low efficiency and very smoky. New to our perception is the possibility that there are globally environmental limits.



The IPCC of the UN has given us some data. Although it's a theory, we can not put a theory with this severe -global- impact to the side of our perceptions, actions and policies. If there are global environmental limits, it's clear that burning carbons formed in million years in just several decades is not the right thing to do. The bottom line is that environmental disaster movies have lead to huge levels of awareness. Movies like The Day After Tomorrow by Roland Emmerich about the possibility of stopping the ocean currents (which will stop the warmth transporting 'global airco' from equatorial zones warmth to the northern and southern colder area's of the world), a stopping that could be caused by the oversupply of sweat water by melting poles, and feature the huge possible climate changes caused by that. Or like An Inconvenient True by Al Gore about the possible massive impact of Climate Change by rising CO2 levels. Also the IPCC report by the UN International Panel on Climate Change (describing scientifically the Climate Change theory and feeding it with some measuring data, but excluded opposite/dissident theories and data) has had huge impact (addressing changing governmental policies). But after some media and governmental turbulence practical almost everything stays the same. This also implies on other local and global environment concerns. It's a proven fact that only economic factors really will cause changes. The use of fossil energy only will slow down as fossil energy (just by market mechanisms and by nothing else) will become more expensive than solar energy and wind energy. Till than it's globally a lot of talk and very little action. Economics are the ruling factor. Greed is more sever that children's future. Has been and will be that way always. We're cheap hydrocarbon addicted (said by George W. Bush, President of the USA, in his State of the Union of January 2006) and just what talk about that addiction can't solve it, addiction is a severe serious issue. Addictions needs medicines to transform their needs or otherwise only cold turkey (instant severe absence, that leads to temperately sickness) will fix it.

GOVERNMENTAL LIMITS

Governments certainly have limits in their function. There a maximum of GDP percentage they could consume, if they go beyond them they blood drain they economies they live on. Limits to governments are not a bad, but a good thing. History has showed us that too powerful governments both slowed down economies and spoiled personal freedom and thereby the lives and wellbeing of their people. Don't aspect solutions from the big issues from governments. Governments are

more catalysts, than that they are processors and realizers. Democratic governments are too busy with pleasing their voters and also maintaining existing structures and too less with the important development of the near future, this must change. Totalitarian Governments only serve a small part of society very well and care too less for the whole society / the full population, this must be changed. Governments are the steer wheel of economy and society. Not the motor. The motor is the market and the people.

History has showed us when governments also tried to be the motor, there was no power. History has showed us when corporations also tried to be the steer wheel, there was no justice. The limit of the governmental layer is therefore also her asset. Governments can't solve PeakOil or PeakOil related issues. PeakOil and its effects and consequences of the effects just are there, no government (also not the USA government by both the dollar hegemony undermining the Saddam Hussein Administration and the PeakOil driven invasion of Iraq) that is able to solve PeakOil, they just can adjust/response their policies to it. The market and the people must do the work concerning response to PeakOil. Governments can steer this development, but never power it. The parable of the motor (market and people) and the steer wheel (governments and politics) and its both specific (but related) functions is very crucial. Governments have beside a functional limit, also a financial limit: Governments get paid by taxation (economic status defines the more taxation possibilities) and by funding budget deficits (economic status defines the limits of funding of budget deficits). The financial limitation of governments will be resized by economic crimp due to PeakOil (giving less taxation and less governmental credit possibilities), but also by more external (low priced) taxation. In a global economy based on e-trade more and more companies will decided to go shop globally for a better taxation regime. And emerging countries will facilitate that severely (by offering low offshore taxation rates), which western countries can not ignore and will lead to lower taxation rates. In a digital era, even local based companies can reduce the taxation pressure by 'stalling' their brand rights or IP (intellectual property) right, or software right (almost any equipment has these days) in trust offices in lower taxation rate offering nations. Taxation has become a product and companies can choose where to 'buy' the taxation. This taxation shopping development also will slash big holes in the (relatively high) governmental budgets of the Western World. Small companies will get the same smart taxation knowledge as formerly only multinationals has. Eventually governments will skip labor, profit and capital taxes and will concentrate their income on consumption taxes.

URBAN LIMITS

In the near future we will face a new type of limit: the urban limit. Current urban environments are designed on the cheap fossil energy model. When this 'feed' stops, cities will become severely more expensive in operating and living, because their external energy demand is much and much more higher by relatively absence of solar/wind originated energy capacity and also severe higher food prices.

FOOD LIMITS

If the whole earth would start consuming meat/fish in the way the western society does, there will certainly a food limit. Meat/Fish rich diets ask for 6 times more food production area than meat/fish low diets. Only 15 years ago Chinese people eat average only sometime each year meat/poultry/fish. The common greeting in China was that days: "do you've eaten today?" (similar to western style "how are you doing"). Today the Chinese people eat average more times a month meat, poultry and/or fish. If all Asians would start consuming meat/poultry/fish in the volumes the western people does, the world needs an other world just for growing animal food. But there is an other major food limit problem: food = fertilizer and fertilizers = energy. Fertilizers are mainly made of natural gas, but also could be generated by oil (+30% more energy needed) and coal (+70% more energy needed) , but those two are much more energy inefficient.

Therefore the food limit could be severely lowered very soon if natural gas (the main process component of harvesting nitrogen from out the air) should be depleted. The production of fertilizers is moving (for easy to understand economic reasons) in high speed to the really natural gas rich countries of Russia and Iran. Producing in all other countries (even with the high prices of fertilizers these days) is not economic possible anymore, because producing from oil (demand +30% more energy) and coal (demands + 70% more energy) is much more expensive. If all other countries doesn't develop very quickly a fertilizer substitute, they will find themselves within a few years in a for their food production needed fertilizers totally on the governments of Russia and Iran depending (both in terms of fertilizers prices and in terms of additional desires) status. To be more specific: the governments of Russia, Qatar and Iran than are on the switchboard of payable global food production. The best possibility fertilizer replacement is a nitrogen capturing algae that can be spread on the soil in one combined action simultaneously with (or attached to) sowing seed. There is also a meat limit in food. When the whole earth starts to consume meat in the quantities the Western

World does, planet earth could not facilitate this. Meat will become severely more expensive and by this supply/demand mechanism the consumption will be regulated by the market itself.

WATER LIMITS

Mankind has reached it maximum level of water use already in many to almost all locations. Spain has severe water shortages, the limit is reached their already. But also in Holland (worldwide known for its dealing with oversupply of water), there are regions (the Veluwe) where water resources declining (more demand than natural supply) must be imported from nearby regions. Water limits will be noticed all over the world in the next two decades. While water consumption per person is viscous rising (water use = wealth = water use) and the world population also rises.

The UN says that each person will have 30% less water over 20 years than they have now. Water limits can be stretched by rain water storage and waste water recycling. The water demand of imported agriculture and industrial products is a currently severe in exposure rising subject. This water use is called virtual water use and has giant figures. Water taxation (Canada has started such a tax for the tarsand industry) will become a governmental tool in stretching water limit sometime further to the future. When the market polarity is switched from demand to supply, several nations will or tax water intensive industries directly or reinvent export taxes (buyers enough in a world where is severe oversupply of only one thing: shortage). Water is not yet a trading commodity, but will certainly become that in the next years. Starting with (from local water limits on that location perspective) not wisely build major cities like Las Vegas. And virtual water use certainly will increase the prices of imported agricultural and industrial products. Water limits are per definition local limits. Water can be exported as H^2O, or (much more simple) virtual as already produced agricultural or industrial product.

SOIL LIMITS

There is certainly a soil quality limit: Soil that dries too much gets eroded. There is only a theoretical soil size limit on our planet. But the world is so gigantically huge that everybody can have the space the desire, even if there were 9 or 10 billions people on earth in 2050. The problem is that we use soil just not wisely; we just stay to close on each other and talk about over population. There is no over

population, just our cities and some countries are over populated. But there are also giant empty space on the world where life can be very good and which aren't used yet. PeakOil will change the population pressure on cities by the fact that cities become economic less attractive by the PeakOil driven price rising effects for city life. Fresh food can be grown by Grow|OS even in artificial underground spaces as Grow|OS feeds them by bio (physical) technology, making cities fresh food independent, without space demand (by the artificial subsurface design of these inner/near city food production spaces). But global meat consumption on Western World levels is a certainly problem when 9 or 10 billion people do so. This is already a problem if 50% of the current 6.7 billion people should consume meat at Western World levels.

Meat consumption based on current production methods requires a second planet in terms of soil. But also this development will be redrawn by PeakOil driven price caused severe less meat demand of meat in the Western World by severe higher meat prices.

IP NUMBER LIMITS

There are no IP number limits. Implementation of IP6 will give the world such a stock of IP numbers that never will be used. Migration from IP4 to IP6 will be done when it's needed and lift the IP number limit for ever.

CREDIT LIMITS

That there are credit limits the world is learning for the second time these days. In the early '80ties there was Credit Crisis I. Credit Crisis I was about the new petro wealth that was put into western banks, which has lead to a situation where the western banks has lend these petro dollars on their own risk as loans to governments of wannabee emerging markets. Wannabee emerging markets are equal to capable of consuming large credit volumes, not equal to actual production emerging. When these governments couldn't lend more, they start to stop paying (something similar happens these days in the USA). The bank governance authorities than correctly demands of the banks that they should make write downs on these 'assets'. Credit as resource has it limit. Not if credit is backed up by real economic achievements and by a reasonable own risk of the credit taker. Free credit leads to chaos, ironically paid by those who have saved. Jim Rogers: "We

face the end of the liquidity party." Even capital giants as Carlyle face liquidity problems.

MILITARY LIMITS

The Vietnam War, the collapse of the USSR, the Afghan War, and the Iraq War has showed clearly that there are limits to military means and effects. Military means are limit by economic health. Holland, Spain, Portugal, the UK, the USSR has all showed the world that, the USA will show the world that. Controlling far away countries, modern colonialism has no future at all. Military power is completely based and funded by economic importance. Declines the economic contribution of a nation in the world economy, its military power declines simultaneously (with only a suspension of several years). In a global economy, with limited resources, which are distributed based on the supply/demand dominated market model, the size of the military power of a nation is not important, but just the purchase power of a nation. When by further limit supply of resources, the prices of resources have reached their maximum level, on top of the supply/demand based market model, there will be a granting based distribution model build (supplying only friendly nations). In granting based distribution models military means are even contra productive. Granting is about friendship, with a gun/tank/jetfighter/bomb you don't make friend that will grant you their supply (unless you support majority repressing governments, but that is in future perspective not very wise). Global power is not longer about military means; it's about resources and economic independency in terms of energy, water, food, elements and capital. One nation doesn't have to fight with an other nation anymore: just cutting off supply will be enough to get their attention completely.

CURRENCY LIMITS

There are certainly limits to which a currency can be pushed by central banks. The financial history of the world is full of collapsed currencies. In this era, we face the possible gradually more erode than collapse type of decline of the US dollar (who is certainly the world's leading currency). When trust in a currency declines (due to the Credit Crisis II, accelerating trade deficits, governmental budget funding by lending replacing governmental income) and therefore the demand for a currency declines, a currency is on it's way back.

The US had since World War II the leading currency. First due to Bretton Woods, later due to being the largest economy and the trading currency of many commodities, including oil/gas/coal. Commodities transactions are switching away from the dollar by value decline and trust decline. PeakOil (as in: paying more for energy, water, food and elements) is an extra burden for the currencies of all nations that have energy, water, food and resources (and thereby capital) deficits, not only the US. PeakOil could have the same effect as the Versailles Treaty has on the Mark post World War I. PeakOil also will lead to the creation of a new inflation free international just for calculation purpose use: The KiloJoule Value. This because for every modern economies does, there is energy needed and energy is the main price component. The KiloJoule Value will be come a huge value in (inter)-national trade and savings. Never as currency (because than it will be blown up by every one that want to do that), but just as a rock in wild currency seas.

BUDGET DEFICIT LIMITS

When companies have a budget deficit they go into Chapter 11 (down sizing, cutting of bad parts) or go bankrupted (stop functioning). Governments can fund their budget deficits still easy. In the US this is changing for the lower than federal governmental layers like cities, due to the absence of bond insurance capabilities. There are certainly limits to budget deficits governments can make. In the early days of globalization, governments could just 'write down' the investments the world has done (like by the start of the USSR), but this will not be possible in today's globalized economy. The old Chapter 11 status for nations was handled by the WorldBank. In the current globalized world, this would go different. China (as major financer of USA governmental debt) could force to be the financial economic executioner for the USA. Taking over the FED and dollar policy and leave 'domestic' politics (except making the budget) for the democratic government. Making debts and not paying them will not be accepted by the world community. The USA should hand over their foreign assets, making an other nation instant the world power that controls the high seas. This is not a fairytale vision. It happened also in 1913 when a group of banks took over the dollar management (out of the hands of a printing government, into the hands of printing banks) by the Federal Reserve Act.

TRADE DEFICIT LIMITS

There are certainly limits to the level of which trade deficits can grow. When they increase excessively the supplying nations will certainly reconsider there supplies. Certainly in a world where demand in not the problem. Why deliver to bad paying customer if the customers with money in the pocket are lined up with their demand. Rising energy prices accelerates the trade deficit of energy deficit nations. If they don't address PeakOil and become energy independent they will loose supply just overnight. Cuba has faced this in 1991 when the USSR collapsed and they don't have the foreign currencies they needed for purchasing elsewhere. Economists and sociologists researching PeakOil should be extreme interested in Cuba her PeakOil (both price and not-granting based) like situation of 1991. Ukraine faces this almost each quarter as they're mostly due trade deficits to late with their payments to Gazprom. By the Ukraine is also a transit country for Gazprom they're in a position to also cut of the gas supply to Europe, giving them the possibility to play power ball themselves. Trade deficits are also the most objective

sign of the structural economic health of a nation. PeakOil increases trade deficits more than reality is ready, willing and able to accept. PeakOil could have the same effect as the Versailles Treaty had ion Germany post World War I.

INFLATION LIMITS

There are certainly limits to which a government or central bank can push inflation. Inflation often is called the hidden tax (by watering realized values as time passed by). Inflation in times of positive economic growth never even has caused any resistance, except from some monetary fundamentalists. Inflation in times of negative economic growth (economic crimp) certainly will cause huge resistance because than no longer the positive counter balance the negative, but there is a situation of double values negative influencing factors. This is called stagflation. Stagflation will put enormous economic/societal pressure on both governments and central banks. Pressure of that intensity that governments could be taken over by non democratic counter forces.

	August 2007	July 2007	Avg. 2006	Avg. 2005
OPEC - Crude Oil[1]				
Saudi Arabia	8.42	8.40	8.93	9.06
Iran	3.87	3.92	3.89	3.88
Iraq	1.96	2.19	1.90	1.81
United Arab Emirates	2.60	2.59	2.62	2.46
Kuwait	2.17	2.17	2.21	2.13
Neutral Zone	0.56	0.55	0.58	0.58
Qatar	0.83	0.83	0.82	0.77
Angola	1.62	1.56	1.37	1.23
Nigeria	2.15	2.10	2.24	2.40
Libya	1.70	1.70	1.71	1.64
Algeria	1.35	1.35	1.35	1.34
Venezuela	2.36	2.34	2.56	2.71
Indonesia	0.84	0.83	0.89	0.94
NGLs & condensate	4.83	4.82	4.63	4.50
Total OPEC	**35.26**	**35.35**	**35.70**	**35.45**
OECD[2]				
US	7.50	7.53	7.37	7.32
Mexico	3.11	3.57	3.68	3.76
Canada	3.31	3.13	3.19	3.06
United Kingdom	1.37	1.50	1.66	1.84
Norway	2.35	2.61	2.78	2.97
Europe-others	0.74	0.74	0.74	0.80
Australia	0.55	0.57	0.53	0.54
Pacific-others	0.08	0.07	0.05	0.05
Total OECD	**19.01**	**19.72**	**20.00**	**20.34**
Non-OECD[1]				
Former USSR	12.64	12.61	12.10	11.64
China	3.91	3.65	3.67	3.62
Malaysia	0.75	0.75	0.75	0.74
India	0.82	0.81	0.79	0.78
Asia-others	1.14	1.14	1.17	1.14
Europe	0.13	0.13	0.15	0.16
Brazil	2.20	2.14	2.10	1.99
Argentina	0.77	0.77	0.77	0.78
Colombia	0.55	0.55	0.53	0.53
Ecuador	0.50	0.50	0.54	0.53
Latin America-others	0.45	0.45	0.45	0.46
Oman	0.70	0.71	0.75	0.79
Syria	0.38	0.39	0.42	0.46
Yemen	0.38	0.38	0.38	0.42
Egypt	0.63	0.63	0.67	0.70
Gabon	0.23	0.23	0.23	0.23
Africa/Middle East-others	1.91	1.88	1.82	1.54
Total Non-OECD	**28.09**	**27.72**	**27.29**	**26.51**
Processing Gains[3]	**1.92**	**1.92**	**1.90**	**1.86**
TOTAL SUPPLY	**84.28**	**84.71**	**84.89**	**84.16**

Source: International Energy Agency Note: Totals and subtotals may not add, due to rounding

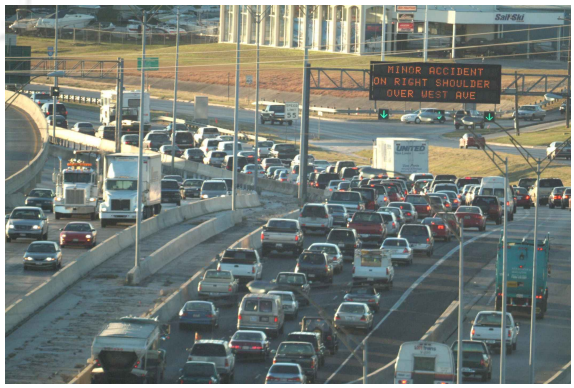
[1] Angolan production has been reclassified within OPEC and excluded from Non-OECD.
[2] Comprises crude oil, condensates, NGLs and oil from non-conventional sources.
[3] Net of volumetric gains and losses in refining (excludes net gain/loss in former USSR, China and non-OECD Europe).

INTRODUCTION

In times of strong increasing demand for resources and declining supply of them it's good to look if there are spills that can ease the pressure on demand in times that demand outstrips supply more and more. Intelligent/smart force back and/or completely out phase certain spills of resources will be a major policy facet of each government, company and family worldwide in the process of maintaining or growing prosperity in times of increasing resources shortages and therefore increasing resource prices. Fighting economic spills always have maintaining or even extend prosperity effects and sure will do in current more shortage driven times.

MOBILITY SPILLS

Mobility is a very positive facet of world's prosperity. But the same prosperity has lead to an -sometimes- unwanted virtual distance reduction. Prosperity hasn't effect daily travel times, but has increased travel distances with the same factor as the travel speed. Much of the current mobility has (in the complete view on economic wealth) even a negative value. Prosperity/economy/wealth is not only about having more products and services. It's also about less time spending on (traveling to and/or commuting to) work and about interesting facets of and having pleasure in doing the thinks that must be done. There is only a marginal difference (if there is any and this is very questionable) in wealth experience in working in an office in own home city or in an office in one of more cities away. This (maybe and if there is: just slightly sized) higher wealth experience of that working place becomes completely negative if travel time, traffic congestion extra time, traffic congestion mal experience, lower health status by less physical exercise and travel costs (a mix of daily and fixed facets) are taken into calculation. Prosperity is certainly not equal to traffic congestion.



Each day an hour extra travel time by traffic congestion can not be seen as positive part of prosperity, it's hard to find prosperity in unwanted commuting home/work travel and/or in traffic congestion. Having each day 2 full hours more free time by working in their hometown, and having less mobility costs and therefore more purchase/saving power is a dream for much of (or all) the commuters. There is a

lot of prosperity (and pressure on resources and energy demand) to gain for all commuters if they could more easily find the job they like with the same intensity closer to home. By people themselves unwanted types of commuting mobility is one of the unexplored yet spills of modern economy that can be addressed for more prosperity and less pressure on energy and resources. Commuting mobility can be reduced in many ways. Things from the new localization features in Google Adwords (finding a better job closer to home) till remote desktop technology (working -more flexible- at an office space in their homes or in -more and more becoming available- new formula based remote desktop workers office space in/nearby the suburbs). Governments can stimulate the avoiding of the by mobility caused spill of energy and resources (and also wealth levels and family time) by proclaiming, information and tax reductions on home or home town office work. This will be much more cheaper than new road plans to address traffic congestion. And PeakOil will solve this mobility spill also very much by the price increase of mobility caused by strong rising motor fuel and public transport prices.

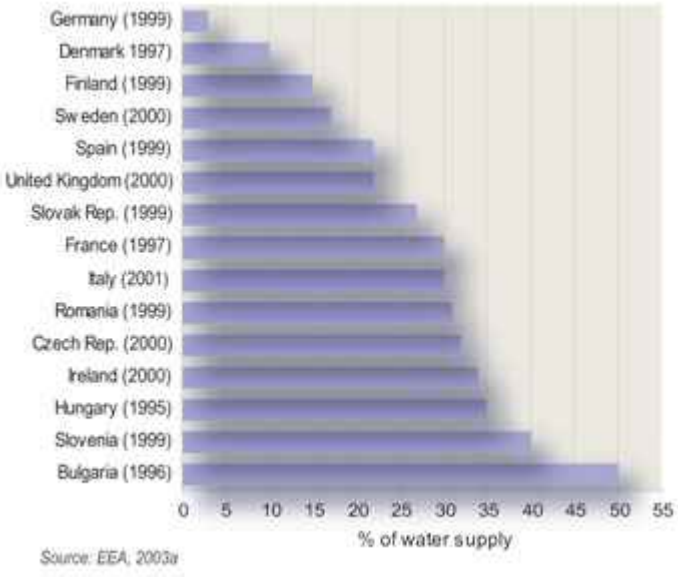
TRANSPORT SPILLS

High speed and cheap in cost per price/km-mile transport is a very positive facet of prosperity. It has made trade of products more easily and reduced the cost of trade enormously and thereby contribute huge to prosperity. But when energy and resources prices rises transport costs become more important and there is a lot of transport spill that can be avoided. By our open market system this is mainly just done by the market price mechanism: making the transport cost of products from further away higher than the cost of transport of products from nearby.

Also in transportation there is an extra transport avoiding ongoing development in the current localization facets in advertising and price calculation based on geo-location data (latitude and longitude positions). Higher transport (caused by higher energy costs and higher resources costs) costs will reduce the ‘food miles’ our fresh food currently has. Higher transport costs and improved localization technology in advertising, sales and distribution will support avoiding transport spills automatically without any governmental policy need to address the transport spill of energy and resources. Avoiding the transport spill contribute to maintaining and growing of prosperity levels.

ENERGY SPILLS
By the fact that energy was relatively in-expensive for a long time there has become a lot of energy spill within prosperity. By rising energy prices (caused by PeakOil) these spills will be reduced severely in the years to come. An example: highway lighting throughout the whole night instead of only in evening and morning hours. The price of energy will reshuffle any energy use that not has an economic value. This is not about improved lower energy use of the same function, but about just cutting of certain types of energy use partial or completely.

WATER SPILLS
In the same speed water gets more valuable, water system quality, roof rain water storage and waste water recycling will grow. Water as being the oil of the 21st century will be less spilled year after year. This will require large renovations of the water infrastructure, which leaks globally average approximately 10% out of the clean sweet water pipes.



Maybe preventing water spill will also lead to more domestic roof water storage systems in houses/companies. This is required by legislation in each new building in both Germany and Belgium. And maybe also to more domestic waste water systems in each house/company (required by legislation in rural Sweden).

ELEMENTS SPILLS
Many elements are unnecessary spilled as waste, elements gets more expensive and waste treatments also. Therefore there is lot to gain concerning the current elements spills. This spilling is based on the tradition of cheap element prices. When element prices go severely up, many ways of wasting elements will be automatically stopped, just by the price mechanism of the market. Many recycling systems these days are subsidized, the need for this will disappear by higher market value of elements. The also increasing price of disposing waste gives an

extra economic motivation to recycling and redesigning industrial production processes. In Holland in the province of Groningen (which wants to become the 'Houston' of Europe by its natural gas reserves), companies with waste streams or warmth disposal concentrate themselves in one physically cluster area. The waste of the one company is a feed for processes of an other company. When the energy price component of each product will become more clear (at that will be certainly the case by the current and severe growing higher energy prices), unnecessary wasting elements will shrink as snow for the sun, because recycling will become very economic by high element prices. This contributes certainly heavenly to the process of maintaining a growing prosperity in times of high element prices. This doesn't apply only to the industry, but also to local households: When governmental budgets shrink (and the will do certainly as PeakOil hits economies), governments will subsidies all kind of local initiative less. Combine this budget shrinking development with much higher resource prices. Then you concluded that paper and iron will be collected by sport/societal organization again (as it has been done till the early '70ties).

FOOD SPILLS

By the relatively low prices of food till now, especially in the USA, each plate restaurants serves has more food on it than the guest ever can eat during the meal. This is both food waste and health problem creation: overweight is a huge problem in America, that causes a lot of personal problems and increasing financial pressure on the financing of the health system in the USA. In the whole world large percentages of the content of refrigerators doesn't end not in stomachs but in the waste bins.

In the whole world a certain percentage of produced food never reach the market and by the food that reached the market also a certain percentage doesn't end by consumers. People start to eat healthier and also less calorie rich. By increasing food prices all this different types food spills will go severe lower levels.

WELLBEING SPILLS

Over emphasizing of just the material aspect of prosperity has lead to major spills of resources. People in the western part of the world more and more re-discover

the more difficult abstract to measure well-being part of prosperity, contributing to much higher prosperity levels with severe less use of resources. Choices like working not 5, but 4 days a week, earning less money by this, spending less money by this, but enjoying themselves and their family much and much more by this has become more and more mainstream in the western society. Prosperity is more and more redefined from owning lots of products and receiving multiple services to being able to enjoy life without struggle for it.

CORRUPTION SPILLS

Corruption demands its part of resources/prosperity without increasing or contributing to actual economic production/prosperity. Fighting corruption in nations where corruption is widely present can be an important facet in maintaining/growth of prosperity in these countries. Corruption even has beside a negative value, also a negative effect/influence on prosperity growth.

OVERHEAD SPILLS

Too much overhead (as in not actual producing, but just controlling production) is widely seen as one of the less attractive side products of growth in prosperity and economic tailwind that easily can be cut out in times of some recession / economic headwind. Adjusting the more Chiefs than Indians model in governmental and corporate organizations to more efficient management or production levels improves prosperity and economic performance severely. Too much overhead create unnecessary spilling of energy and resources without any contribution to prosperity/wealth. In most cases to much overhead even create beside a negative value, also a negative effect on prosperity.

DIVORCE SPILLS

The mega divorce wave of the last 50 years that has gone though western society has caused a major spill of resources. This is not an old fashion reactionary vision, but just a mathematical conclusion, confirmed in the last years by several environmental research institutions (who have the guts to address also political not sexy issues) in the last years.

The global environment and the global resources situation are better off with purchasing a SUV and daily fueling, than by getting a divorce. Good divorces are good for prosperity (as in: the well being facet of it). Unnecessary divorces are they really there? When the economic going tough, divorce rate will certainly become much more lower. In times of economic headwind caused by high prices resources, people certainly will put more effort in trying to get a relation back on the right track. Because divorce will be more and more equal to severe less prosperity for both parties involved.

GOVERNMENTAL SPILLS

Governmental structures can burden or facilitate economic development and prosperity. The major thing governments must see that they aren't able to be the motor of their economy (that's the market which is driven by companies), but that they are certainly able to be the steer wheel of their economy. This major difference in function is crucial. History has learned the world that when corporations become beside the motor also the steer wheel of their society (extreme capitalism) prosperity levels are heavily damaged. On the other hand history also has taught us that when governments becomes beside the steer wheel also the motor of their society (extern socialism) prosperity levels also are heavily damaged. When governments tries to become beside the steer wheel of economy also the motor of the economy results this in major governmental spills of resources (energy and elements). When governments return to their true function as steer wheel of their economies many resources spills of their own function as of their governmental market entrances will be stopped and by this general prosperity levels will grow. Governments also can play a huge role in forcing back spills by transforming their taxation model away from labor tax to consumption tax. This encourages a more services society. Services are labor intensive and scores high on prosperity measuring scales. Lower labor costs by putting the tax pressure on consumption is good for resource spill avoiding (a waste based economy is an economy where labor is more expensive than resources) and also very good for the global market position of their country. Governments also spill resources by addressing the past. PeakOil is almost only a governmental issue in the USA and Israel (seen from energy deficit point of view). All other energy deficit governments are still working/ focused on terror, roadpricing and designing megahubs if there is no PeakOil situation at all.

MILITARISM SPILLS

Militarism (and its climax war) are two major spills of resources (energy and elements) and also of material and non-material prosperity. Of course militarism employs many people but the cost of militarism is taken out of and that way burdens the market economy. Militarism and war are two negative posts on the balance sheet of each nations and of the world in general, who both nothing actual add to the economic production of the world. Militarism and war are overdue concepts of the past creating major spills of resources (energy and elements), prosperity in both own and targeted nations and global well-being levels. Actual war even destroys economic values and thereby creates on both sides also major losses, destructions and spills. Also on both sided there is non material damage, even of lives of fathers/mothers/children as soldiers and -more and more in today's

kind of wars- innocent civilians as 'collateral damage'. More militarism and more war demands more energy and elements, less militarism and war avoid mega spills of energy, resources, prosperity and lives. Governments must actively stimulate the weapon industry to let go the weapon market and to enter the energy market.

The current global demand for energy facilities is a huge opportunity to redevelop the military and war focused weapon industry to a peace focused energy facilities industry. Weapon conglomerates are technocrats by heart. Technology and maximal effects focused high skilled groups of companies with splendid political liaisons. The only way to end militarism is by 'converting' the weapon industry to new more attractive (both in volume and technology) markets, by giving them new market opportunities. Armies also must not be brooked down and driven to bankruptcy (for reasons of their tight political connections), but also been redeveloped to unarmed 'making a different' developer in non conflict areas. Integrating National Foreign Affairs, Defense and International Development budgets in to one big national value and technologies advertising 'power' force. The United States Army Corps of Engineers (US ACE) is a very good example of this for the world. The only new people armies must hire are well educated immigrants as nation's liaisons with the rest of the world. Why? Because resources certainly will become more and more scarce in the next years. The first scariness addressing distribution model that will functioning is the open market price mechanism, driving resources (energy and elements) that become scarce to higher price levels and thereby also by price mechanism reduce the demand severe, but at a certain level prices can't rise anymore higher because otherwise nobody can afford to buy the resources anymore. Than the second scariness addressing distribution model will come in place and that's a political system: nations only will supply for these maximal prices the nations with which they have bilateral or multilateral relations. And then military systems and actual use will work strong contra-productive. Make friends, no enemies will be the slogan of national resources focused politics in times of more tighten resources supply or even resources shortage. No nation has the economic resources and political possibilities to rule the whole earth. Also the USA as current superpower cans impossible control the whole world. Controlling the high seas is the most there is to achieve for a global empire. The Spanish has done that in the past, the Dutch has done that in the past, the English has had their time in history and these days the USA rules the high seas. The current world supremacy of the USA is also very much build on the absence of strong global counterpart players than only on USA supremacy. Europe has had her time of supremacy and has learned from it and is to much internally divided to become a superpower, don't

have an own army (the first thing a super power old style needs) by its NATO bounding with the USA. Military power has always been and still is based on economic power. There are some severe cracks in the economic power of the USA (weakening own economy, large debts, huge imports, declining exports, lost of dollar supremacy and less US friendly global atmosphere). And Russia for example is quietly building huge economic and geopolitical power worldwide and especial in Europe, Euro Asia, Middle East and even in Africa. Russia has lost its empire end 80's by the oil price drop caused by the oil market supply of the Saudi on request of the USA. Russia hasn't forgotten that, that's still in the books. They send sometimes some airplanes for a trip on the ocean (mainly only during NATO meetings), but the know that nobody ever will be able to oversize the USA military in terms of size and technology. Russia has chosen for a different type of game: economic power based on their actual owned Carbon Reserves. This is a force the USA never will have and a force that will have final weight both economicly and military. Therefore the USA would be very smart is they switch very quick from military power to bilateral and multilateral relations, because in times of absolute shortages and maximum resources market prices, the politically driven scariness distributions model will absolutely pass the former brute nations that has used military power excessively. And one nation never will be able to rule the world military, even in times (like now) when the USA controls the high seas worldwide.

An actual example: Iran and Venezuela (and maybe also Russia) have made a bilateral agreement that, if one of them will be attacked by an other nation (reed: the USA), the other will immediately stop delivering oil and gas to the attacking nation(s) and this way cutting off the energy supply to the aggressor. A modern version of NATO and Warsaw Pact. But this is fighting 'in new style' without spilling money on weapons and not economic contributing soldiers. Much more cleaner and certainly much more effective. Ask Germany what happens than with military power and nation's economy if that happens: they have faced an identical situation 60 years ago. Military organization and means are the less effective and worst way to act for insuring resources supply in a world with resources supply issues. Military means will become old fashion 20th century old skool type of serving national interest, totally contra-productive in a globalized internet connected world. Some wizzkids can harm a country much more severely than two armies. The globalized 21st century is about building relations between nations. Networking instead of military focused nations are the winners of the 21st century. Military is just a last remaining facet of the dark ages, a waste of resources and economic negative for the nation that operates it. Hawks certainly will lose it from mutual interest

between nations exploring diplomats. Diplomacy and bilateral corporation will gain 'market shares' in international politics enormously, military will lose 'market shares' in international politics severely. Gazprom has become much, much more important and powerful than NATO. It's not accidental that the current President of Russia will become CEO of Gazprom after his resigning as President. Politics and Economy are melting more and more together, after this was decades since the Second World War only USA practice. But it's only a winning combination if there are really resources to deliver to the world.

The USA had already had two energy connected presidents: George H.W. Bush senior and George W. Bush junior, both from Texas and both have spend almost their complete lifetime in the Texan Oil Industry. But both had the headwind that the USA is running out of resources, so there was no energy to deliver to the world market (and that's what makes national economies to global economic empires). The new wars are pure economic and are not about tanks, but about banks. Not about bombing, but about 'education' (as in: learning obedience lessons to the other nation) by cutting off / pausing own current deliveries to them. You don't make friends with riffles and bombers, and friends are what nations needs in times of PeakOil. Nations that are energy/resources deficit, better very quick 1) stop thinking/making war, 2) work heavily on mutual bilateral development projects and 3) realize new energy generation as soon as possible to make them independent and stop capital leaks and trade deficit increase. Militarism will just out phased by realized effects by smart political leaders, supported by the real peace doves by heart and just easy talking everyone's friend smooth talkers. But real bilateral relations will be the assets of nations in the end of Carbon and after Carbon.

INTRODUCTION

Concerning shortages there are two main facets. First main facet: Resources are formed in millions of years, we used till we're through them, they aren't renewable. Resources can't grow, there are not new resources formed, they are only there to be used, till they are worn out. Second main facet (weighting the burden of the first main facet): Demand for resources rises each year enormously (by both world population growth and by world prosperity growth). Each year more and more people with more and more economic wealth desires must share shrinking supply. Globally we consume all our (even finite) resources in an each day increasing burn-rate. The combination of these two developments (declining supply and increasing demand) is double times bad luck and leads automatically to severe price rises by just the market mechanism and can even lead to shortages and (economic or practical) cut off's. The world uses in an increasing rate/speed the available limited un-renewable stocks till they are worn out (as in no longer available). Even for renewable resources there can be shortages. Renewable resources must be 'harvested' and when the 'harvesting' investments not been made, they of course can't be harvested and contribute to shortages. Technology and investments are major facets concerning the usages of renewable resources.

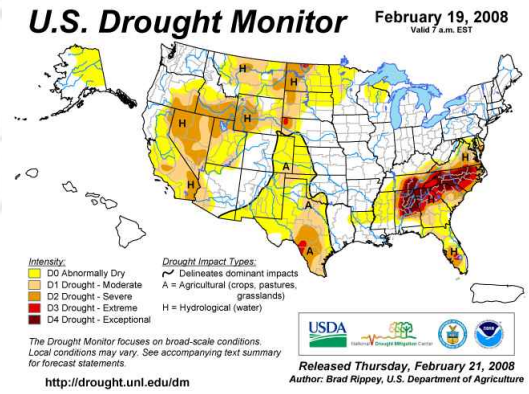
ENERGY SHORTAGES

The easy to find oil and gas era is over in 2015. This is not a quote of a left wing environmentalist, but a quote of the CEO of Shell on January 22, 2008 on the Shell website. And this new barrels are more difficult to explore (to deep, to cold), and not light and sweet (but heavy in formula and sour by large quantities of sulfur in it). Cheap (easy accessible and easy quality) oil and gas is over. By these two (more difficult to explore and more difficult to refine) developments oil/gas exploration and oil/gas refining will cost increasing more and more which of course results in a severe price rise of oil/gas. But extra to these two price increasing developments there the two earlier mentioned (population growth and prosperity growth) price increasing developments.

Combined they're create not double bad luck, but four times bad luck for energy prices. But the most impact facet is that there is just not enough fossil energy for the world in the years to come and that within our lifetime fossil energy resources will be worn out (as in: no longer existing). The world has reached her fossil energy limits already and the end of fossil energy is in near site. For each 9 barrels we use, we find only 1 new barrel; even a child can give you the conclusion of the balance. We must phase out fossil energy rapid or it will phase out our economies. Energy certainly will demand a much and much larger space in all governmental, corporate, family and product budgets in the years to come and therefore (by the price mechanism) will certainly lead to a less energy consuming global economy and global society. Economies will be turned around to high prosperity low energy economies.

WATER SHORTAGES

Only 1% of all the water on earth is accessible fresh sweet water and it's not always on the locations where and in the timing when it's needed and it's certainly also not always free of pollutions. These days 25% of the world population has severe water shortages. According to the UN in 2015 even 50% of the world population will have some or even severe water shortage. Water will be the oil of the 21st century. Large cities and urban areas have grown from economic perspective enormously on totally the wrong locations from water perspective. Subsurface sweet water reserves all around the world are formed in millions of years and are declining rapidly. Water will be transported more and more from long distances by pipelines and even by mammoth size ships.



Water will demand a larger space in governmental/corporate/people's budgets in the years to come, pushing partial other spending out of the budget, because each dollar/euro can only be spend once. Recently George W. Bush visit the Canadian Government for environmental request and attached high level negotiations concerning the Great Lakes (only Lake Michigan: 22400 square miles / 5806 km^2) is fully within the US borders). The Great Lakes are heavily polluted by the industries that are located on its borders. And some parts of the northern states of the USA really can solve water shortages with the water from the Great Lakes. But transportation of this water to Mid American states and the South East states, is 1) expensive, 2) centralized, 3) so malfunction vulnerable and 4) sabotage vulnerable. Living,

farming and enterprising is the cheapest and most stable done in areas with enough water. In other areas water prices and water shortages always repressing live/farming/business.

FOOD SHORTAGES

Current global agriculture system uses very intensive fossil energy, water and fertilizers. Fossil energy prices rise with more 50% a year. Water is becoming more and more scarce and therefore more and more expensive. Fertilizers are almost complete manufactured based on the Haber Process, and therefore mainly dependent on natural gas, which is also strong rising in price and is very limited in supply and must compete with other global demands for it (large is widely used for heating and power generation purposes). Oil (+ 30% more energy needed) and coal (+70% more energy needed) can be used to produce fertilizer by first converting them to synthetic gas, but are much more energy inefficient in use. An other food facet is geopolitical: Russia and Iran are by being the major natural gas suppliers of the world, the two nations that within 5 years from now will be the origin of our current food production system. The certainly are developing a natural gas cartel on the moment. More concrete: 5 years from now Russia and Iran will control the fertilizer market completely (just by having the natural gas reserves needed for production off fertilizers). Fertilizer plants in other countries are closing for energy price driven economic reasons in too high speed. This major development is widely unrecognized and can lead to severe geopolitical power balance swifts and also to severe geopolitical tensions. Nobody hit the hand that feeds; each government will be friends than with Russia and Iran. They also can decide to declare fertilizer embargo's to certain nations, shutting of these nations remotely from food supply. Resources and geopolitics are the two sides of the same coin. A reversed example: In the midst eighties the USA under the Ronald Reagan and George Bush Sr. lead Administration has asked the Saudi Royal Family to oversupply (with price difference guarantee of the USA) the oil market for some years, so that lower oil prices would cause the USSR her bankruptcy. The low oil prices as result of this market over supply had cut the USSR of their major export income and lead to the bankruptcy of that federal nation. The USA has compensated the Saudi Royal Family for the missed income, but that was a bargain compared with the cost of operating a Cold War. Russia (as remaining state of the USSR) has not forgotten this event. It's still on the geopolitical 'balance sheet' between the USA and Russia.

When the USA is completely depended on Russian, Qatari and Iranian produced fertilizer, two of those three –as being not so good friends of the USA- can draw this huge wildcard in geopolitics. The USA Administrations depends too much on their military power, forgetting that real friendship between nations is based on trust and mutual benefit instead on force. The USA can maintain their current only global superpower status just for one reason and that is the market dominance of the dollar. But this market dominance of the dollar is weakening each year, undermining the USA unlimited capital supply. The War on Iraq was not for WMD (weapons of mass destruction), nor for the brutal dictatorship of Saddam Hussein, but tree other reason (getting the oil of Iraq, getting regional exposure and -last but not least- to undo the change from payment of dollars to euros Saddam Hussein has did. The USA can maintain their military power only as long this is feed/financed by the dollar dominance. This dominance was long time reasonably based on a solid economy of the USA. But since there are severe second thoughts about the health status and foresight of the USA economy more and more nations replace the dollar as their main reserve currency and more and more commodities are no longer traded in dollars. The USA Administration certainly needs to make very quickly some real friends (before their economic over-stretchiness -and therefore their military over-stretchiness- will be phased out by the world economy) otherwise they will certainly face severe food/nutrition problems for the economic lower half of their society/population. And less wealth is something these less economic part of society are used to, but less food will certainly lead to severe societal unrest. And of course the world needs very quick (as in: yesterday) a replacement for the worldwide mostly on natural gas depending Haber Process production method that is currently the mainstream production method. Oil (+30% more energy needed) and coal (+ 70% more energy needed) can be used, but are much more energy inefficient in use. Because otherwise organic (dual focused: flora and fauna combining) agriculture is the only remaining option and the world certainly can't change very quickly to this system, because it's structural different. And also in these systems there will be more taking from the soil than be giving to the soil. Research for mixed production of fertilizers by algae's in waste water grown, or (and this will be the solution we by Indus think) by algae's that can be spread on soil and then capture on the soil surface the N^2 (nitrogen) in the air to the soil, or by algae's in air brushed sweet water algae farms, or by N^2 capturing flora in more polyculture based agriculture is a very urgent need for maintaining world food supply. Climate changes (as in: conjectural more extreme weather

conditions and as in: structural change in type of weather) could also have heavily effects on food production levels and therefore on food shortages. By all these facets certainly food will demand evocable in the next years a lot more space in family budgets (and therefore in national economies), pushing partial other spending out of the budget, because each dollar/euro can be spend only ones.

ELEMENTS SHORTAGES

Elements are more un-renewable than anything else on the planet. Energy can be made renewable, but elements like iron, copper, zinc, lead can't be made renewable like energy can be. Elements are the real shortages of the future. Increasing world population and increasing world prosperity will push demand for elements continuous up, by continuous lower supply and continuous more difficult exploration. Below the graph of the nickel price. Nickel prices of $ 50.000 per ton ($ 50 per kilogram!) are the recent industry forecasts for coming year.

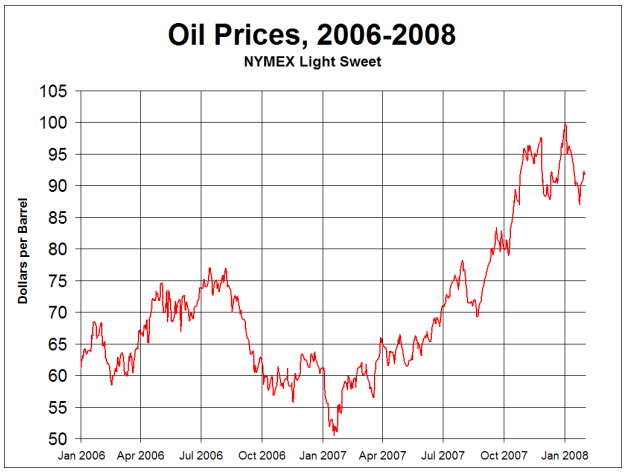
Continuous rising prices of all elements is the result of these shortages. The average price rise of commodities in 2007 was even above 100% in one year. The element facet will demand a lot more space in all global product prices in the next years, which certainly will result in higher price rises for all global products than prosperity growth rates, pushing consumption to lower levels and slowing global economy growth by these element shortages. Element theft is becoming a special branch in small and big crime. It used to be a Middle Europe and an Emerging World problem, but in 2008 this is changed. In Holland people stole large quantities of copper from a new not used railroad that connects Holland with Germany. In the UK all old churches (of hundreds of years old) have these days roof surveillance cameras, otherwise they weren't to insure anymore for lead theft. Just take 5 minutes a Google on http://www.google.com/search?q=theft+lead and maybe replace lead also by other metals. Community centers (schools, churches, governmental buildings) are the easiest (and therefore first) targets, but what happen with domestic lead on houses if prices will rise much more higher than they are today is easy to guess. Element shortages will lead to a huge rise of glass technology. New types of glass will replace the elements as they are running out. But for now: elements shortages leads to high elements prices and every nation just pay the by supply/demand created market prices.

INTRODUCTION

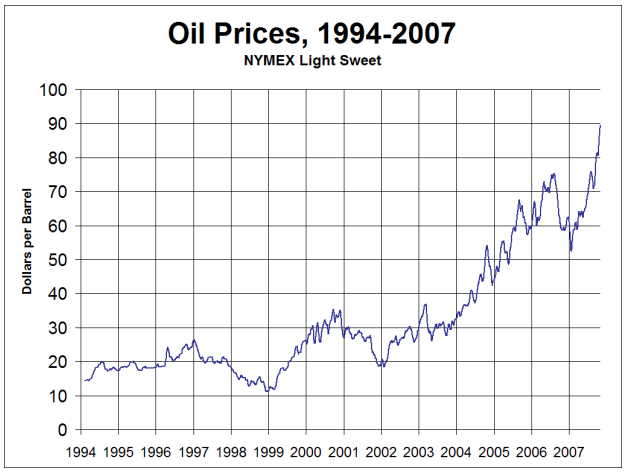
The declining supply of resources, combined with an increasing demand for resources (caused by the world's population growth and the world's prosperity growth), and the excessively increasing of resources exploration costs, will have some severe (absolutely not small) effects on local, regional, national, supranational and global economies. Unlimited shortages instead of unlimited resources, causing a market polarity changes with all its effects. That's the future of the global economy in one line. More people with more wishes will have to do deal with first equal and/or limited and later on declining resources which more and more only can be explored against much more higher costs. This certainly will have huge effects, certainly when resources that are not renewable are involved. More demand than supply and increased exploration costs will lead to much more higher prices and that will have its own effects. Price rises of resources are both a direct treat to the prosperous countries that use them currently a lot (this is grown by the former low prices). Price rises will hit the Western World severely harder. But also the Emerging World will be harmed by the effects of the limits that has rise by PeakOil and Climate Change related issues.

HIGHER ENERGY PRICES

Resources (energy and elements) are the basic ingredients for each product and service we use and therefore represent a certain price component. By low energy and element market prices this fact isn't something of huge importance, labor was the main price facet that matters, this was the main reason behind industrialization in the early days and the main reason these days why industrial production is moved from western countries to emerging countries. But the labor facet of each product has by industrialization become severely low. The energy cost of production and transport is the main cost price facet, even by low energy prices, but by the historical low level of it (and the facet that's needed) we don't saw it till now. But when energy and element prices rises severely energy price component and element price component will become a matter of huge importance. Because every product and service that was based on loads of cheap energy and cheap elements (and, is not any product and service that?) will become suddenly increasing expensive.



Higher products prices and higher services prices will lead to less prosperity. Energy takes a special place within the resources, because it's the only resource that is used for literally every product and service. Each product and service also needs water, water that also is becoming more scarce and therefore more expensive. The energy component of each product and service is not know yet, but rising oil/coal prices will certainly make that clear to every company and customer. Rising energy prices takes some time before they are reach the market in prices of products, this because a lot of energy is purchased in long term contracts. But double energy prices (the situation we'll reach in the combination of the years 2007 and 2008) will give an 50% product price rise when the energy price rise reach the market in products. A 4 times higher energy prices gives double expensive products and a 6 times higher energy price will give a triple high price level of products. This is not science fiction, but just the effect of the global market mechanism of supply of and demand for energy. The labor component of each product is very low and the energy component of each product is very high. And not only manufacturing costs rise by energy, also transportation costs and sales costs will rise in the same factor by rising energy costs. And not only energy prices rises, also material (elements or biological originated products) are rising. The simple question behind this all is: will the global oil production rise, stabilization or decline, and if it would rise (not many believers in this left), will that be enough to meat the rapidly increasing global demand, even when the USA (5% of the world population, and yet accountable for 25% of the global demand) maybe will use severely less by going into a recession.

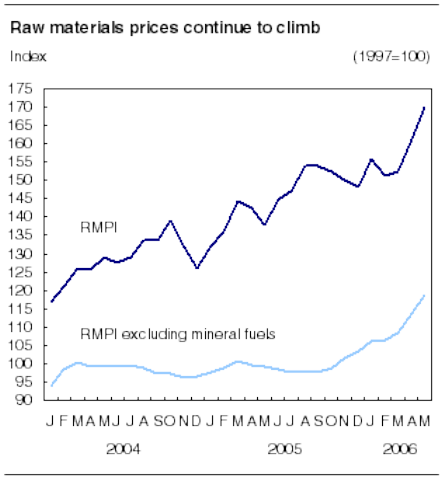


Replacing coal to power by oil to power is not longer an option that release market pressure on oil, since end 2007 the coal prices rise even more than oil prices. For now: the world production doesn't move from it 85/86 mbd (million barrels a day) and yet global demand increases daily, while supply is currently plateauing and soon will declining (or we must find a new Saudi Ghawar like field each year). This will have a huge market price impact. It has lead (and will lead further) to a market dominance polarity change. The producing countries are running now the show and they are well informed that the time nature has given them natural resources to explore is limited. They all have huge budget surpluses and have not any motivation of increasing production by expensive investments. They know that next year the prices will be much more better than this year. This market polarity change is the reason that oil prices never will go down: supply has taken over control of the market and they have no hurry at all to end their beautiful party for the benefit of wealthy nations far away, non of the suppliers wants to spoil rising prices by (in from their point of view stupid) production rises and the big question is: are they able to do so, many analysts say that everybody is producing on maximal levels. Beside the market price facet, the exploration price facet of fossils become more and more important, just because almost all easy exploitable reserves are declining (making them more expensive to explore in their last years) and leaving only the hard to get (as: expensive exploration) reserves to explore. An other price rise for energy. Cheap oil is over. We're enter an economic new era of high energy prices. High energy prices are the free choice driven taxation of the energy rich emerging nations to the current wealthy western nations. Wealth is equal to high energy consumption based due the low energy prices of the past. The price rises can be seen on the next IMF Actual Market Prices for Non-Fuel and Fuel Commodities datasheet: http://www.imf.org/external/np/res/commod/table3.pdf. This IMF sheet give a very good and solid sight on the material price rises of the last 3 years.

HIGHER MATERIAL PRICES

But not only the energy prices will rise, all other resources will be higher priced due to more demand and declining supply and higher exploration costs due to more difficult situations of new exploration. Exploration also takes a lot of energy, so the price rise of other resources maybe will be double (or even more) percentage of the

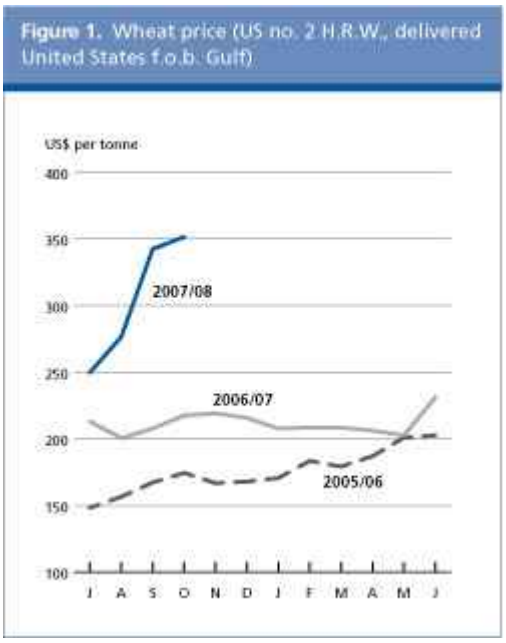
price rise of energy. This not only effect elements, but the prices of all material, independent or they oil based, elements based or agricultural based.



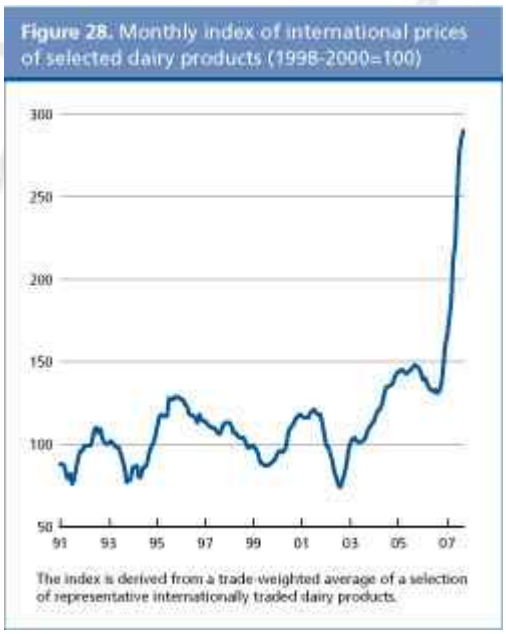
So a combination of the fact that they are also energy demanding in manufacturing, plus the fact that they face the same facets what made energy expensive (increasing demand, less supply, higher exploration costs) also make elements expensive. Copper, iron, wood, packing material, anything that use resources will become much more expensive. The inflation figures of the US dollar against all commodities are very high. Nickel and copper prices have gone trough the roof. Iron becomes more and more expensive by increasing market demand and price doubling of the cooking coal needed for its production. Also here the commodity market report of the IMF on http://www.imf.org/external/np/res/commod/table3.-pdf says it in cold figures.

HIGHER FOOD PRICES

Food is Oil. For each food calorie we consume, globally average 10 fossil energy calories are burned. In Europe and Japan this is average 1 to 40 and in the US this is even 1 to 90. Higher oil prices are equal to higher food prices. No oil is equal to no food (but that's not the subject here, although is the unfortunately truth). A second development that causes higher food prices is the accelerating global demand by the grown wider spread higher prosperity levels. The EU has no by subsidizing caused milk sea, butter mountain or wine sea anymore. An example: Cheese prices in Europe have rising 20% in 2007 just by the milk purchases of Chinese importers on the European market. Two never stopping developments will give year after year higher food prices globally.



Local food production will gain enormously in popularity, for prices reasons and for independency reasons. The cost of living will severely increase by the rising food prices. In the western world (with low economic growth or even economic decline) food will take severe more space in people's budget and purchasing power.



The FAO (Food and Agricultural Organization of UN) publish twice a year an agricultural market report (UN FAO Food Outlook), the latest is of November 2007: ftp://ftp.fao.org/docrep/fao/010/ah876e/ah876e00.pdf and indicates an 37% overall price rise of food from September 2006 to September 2007 and for example

for dairy/milk products it even states a price rise of 88% in that period. Any good news in this not pleasant development? Yes, the price difference between home cooked food and restaurant dinners will be less.

HIGHER WATER PRICES

As clean sweet water become more and more scarce the price of clean sweet water will rise. Till now water is a typical local product that till now not is by human activities transported over long distance (accept of course natural by rivers). As water become scarce it will get a greater economic value. Both actual water (mainly for cities) and virtual water (mainly for mainly importing economies). High water prices will have a price rising effect on both agricultural commodities (coffee, tea, cotton, sugar, wheat, corn) and imported fresh fruit and vegetables. Making food (and therefore living) much more expensive. Grow|OS can reduce the water demand of fruit and vegetables and therefore will also be used for local food production in water deficit area's even when they are near the Equator in very grow stimulating climates. The accessibility to water is equal to wealth.

An example: Spain is drawing a giant sweet water plan (Spanish National Hydrological Plan), with a cost of E 19 billion (for the first phase). The government wants to create 112 new water reservoirs and dig/blast 1000 km channels out of the 910 km / 565 mile long Ebro River (the river with the greatest discharge in Spain) for distribution of her water to the more southern parts of Spain, with the attached price of salination of the Ebro delta in the Tarragona province, midway between Barcelona and Valencia. Also these investments must be paid, partial by the government, partial by the water users, increasing water bills in southern Spain severely. Opposition against this SNHP claims that curing the infrastructural water losses of 20-25% in targeted supply area's a much more better solution will be, but this asks for a complete new water distributing infrastructure in the whole of South Spain, but that will increases the water prices in Spain even more. Below a graph of water system losses in several countries in the EU. Other opposition movements promote a rainwater conservation legislation plan, that demands roof rainwater storage facilities in each new house (like Belgium and Germany already have), or even for each existing house/building. More demand (real estate boom in South Spain) by less supply and higher exploration costs has always its price. Spain is the

first government that addresses the water issue. Other nations will follow. All sewer systems in the Western World are average 40 till 100 years old and leaking severely contaminated waste water into clean ground water layers. Redevelopment of sewer and water infrastructures will burden national governments (and therefore economies) severely the next decade in times with already severe PeakOil caused and other headwinds. Ordinary every day clean sweet water will be scarce and water certainly will become the 'oil' of the 21st century. Water for free, or cheap water prices will become an illusion in the years to come.

INCREASING INFLATION

Inflation is often called the hidden tax of governments. Taxing economies outside the IRS. Webster's definition of inflation in 1983 was: "An increase in the amount of currency in circulation, resulting in a relatively sharp and sudden fall in its value and rise in prices: it may be caused by an increase in the volume of paper money issued or of gold mined, or a relative increase in expenditures as when the supply of goods fails to meet the demand." Webster's definition of inflation in 2000 was changed to: "A persistent increase in the level of consumer prices or a persistent decline in the purchasing power of money, caused by an increase in available currency and credit beyond the proportion of available goods and services." Remarkable is that in the 1983 definition the cause plays a central definition role and in the 2000 definition the effects plays a central definition role. Money supply has been seen as the current main reason behind inflation, but PeakOil will bring back the dual caused definition, adding the sentence "A relative increase in expenditures as when the supply of goods fails to meet the demand." again to the definition.

Inflation in times of positive economic growth are always forgiving to governments, but no government can walk easy away with high inflation rates in times of negative economic growth. PeakOil certainly will increase inflation rates severely 'as the prices of goods and services will increase rapidly by lower supply of goods to the market'. Inflation rates higher than the actual economic growth, hurt the positive economic growth and turn it into negative economic growth (as in economic crimp or decline) till demand and supply are equaled.

EMERGING ECONOMIES

The market mechanism of declining energy/elements supply and accelerating demand for energy/elements will cause high sale/income/production revenues for all the energy/elements/soil/sun rich countries. The prosperity/wealth, domestic and foreign financial assets, gold reserves, foreign currency reserves and their (often named) Sovereign Wealth Funds has grown and still will grow further tremendously. They will buy controlling positions in companies listed in both emerging and western stock exchanges. In 2006 this was unthinkable and in 2007 they were invited as the rescuers of the financial industry. The EU discusses these days a written statement of the Foreign Governmental Wealth Funds that they'll only act by economic motivations and will not by political motivations. But is there really a difference between these two? Asking the stronger man, not be strong is an act of weakness. Real capital has been transferred to the Emerging World by purchases. The Western World has been too much focusing on consumption and face now the always attached severe phony capital problems, just when the whether turns worse. The financial market of the Western World has gambled and has lost their own beds. This implies also European Financials who have purchased over-valuated US over-consumption debts, that were covered by only in good whether working monolines (bond guarantee companies), who can never burry the burdens of all these losses. Ambac will be 'rescued' by a capital injection (of the insurance takers, who turn their claims on Ambac into Ambac 'company capital' on a way it can be noticed as Basel Tier One Capital) of only $ 3 billion on their apparently not much well thought trough risk exposure.

These monolines market leaders 'guarantees' several trillions $. Monolines are the switchboard of the financial industry and the value of their current issued guarantees can not be determined. All guarantees of monolines will become worthless. The big beds are going bad (title of a book on this issue) in times of multiple simultaneously headwinds. The monolines are the black holes of the current financial system. The financials of Europe (and thereby the EU) will be grateful for the coming rescuing or even restarts supporting by the Foreign Governmental Wealth Funds, because phony loans will eventually be valued as phony and thereby worthless, slashing major deficits in the capital position of every financial in Europe. Pipelining losses for some time is possible, but this can not be done for ever. Monolines never can pay out al the losses on phony loans they've guaranteed. And unfortunately the monolines are the foundation of each financial world wide. Guarantees will become worthless, only real values will count. The market polarity change has also caused a capital polarity change and the Western

World has made some severe stupid things to maintain consumption even after actual production was moved away, opening themselves for a huge pile of problems, SWF's (Sovereign Wealth Funds) can use the current and coming more severe problems by the financials to take over the global financial markets by acquiring huge banks (as in: customer bases) for a fraction of the value they had before Credit Crisis II. They SWF's own at least $ 3.000.000.000.000 and their capital grows each month mostly due to high energy prices. The used to be rich western world will become the main creditor of the energy and elements rich countries. Energy and elements are the transfer road of capital, wealth and prosperity.

DRAINED ECONOMIES

The USA destroys/exports (by the current price level of average $ 90 per barrel crude price and a total price of approximately $ 117 by including refining, storage and distribution) an $ 1.825.000.000.000 (the USA uses 25% of the yearly global energy budget) of own earned or borrowed capital a year by their addition to oil to other economies (own production not deducted because it could be exported). When putting the Pentagon budget on top of it (is their any other reason than energy supply/security for these offence/defense structures after the end of the Cold War?) with it $ 624.000.000.000 budget, this amount is $ 2.449.000.000.000. When we also add the hidden costs/damage of defense, war and less export by the global image damage caused by offensive politics and calculated them on $ 551.000.000.000 (the Iraq War is partly financed by extra Pentagon created special purpose budgets) we get an enormous (yearly!) US economy capital drain figure of $ 3.000.000.000.000. A further increasing to $ 200 per barrel oil price, will put an other $ 1.500.000.000.000 to this leak, bringing it up to above 35%. Energy over-consumption was possible by low energy prices, but by high energy prices, it drains even the most powerful economy of the world to severe dire straits. And as extra burdening facet: This figures are without the interest cost of both government and companies for borrowing their part of this figures, where by it not only burden current economic year, bit also the years to come by its interest payment demands. These three (with the interest rate facet: four) huge capital drains are not an economic problem; they are an economic disaster/drain for the US. This capital could stay within their borders if they start other energy generation programs and other economic models. Buying fossil energy is getting more poor. Fossil energy doesn't give prosperity anymore, it drain prosperity these days.

Fossil energy has become a completely unnecessary economic power loss/drain. And the worst facet: It's a short way. Fossils are running out. Leaving the US with debt, no new energy and a damaged international economic and governmental image. Also threatening there fossil energy supply needed for energy transition to renewables when the granting distribution model will be replaced on top of the demand/supply generated market price based distribution model. Blaming George W. Bush for this is short sighted. All global economies still totally on the to a dead end leading fossil energy track. George W. Bush is one of the first global leaders who had the courage to admit this in public as early as January 2006 in his State of the Union, will other politicians where still asleep concerning this matter. Never the less a nation that leaks 25% of its GDP to energy related expenses to foreign countries doesn't act wisely, and yes only a nation with a huge trade and budget deficit funded by the global hegemony of its currency can survive such a capital leaks. The bright future perspective: picture the strong vital US companies and economy without these huge continuous energy caused capital drain: it will maybe become as vital as it was several times after the Second World War.

PROSPERITY HEADWIND

It's not hard to understand that the by increasing energy caused higher prices for products and services (and even food) certainly will lead to less prosperity, just because these price rises will not be covered by economic growth, but even opposite certainly will be guided by economic crimp. No other conclusion of the effects of rising product prices is possible in the current on stable level staying, not equal rising incomes/economies. This will certainly lead to higher prices by higher energy/element prices and less income caused by economic crimp caused by the higher prices. It is not money creating inflation, so economies will be confronted by double inflation causes and therefore figures. High prices for energy/elements are nature's own tax, leaving governments behind in prosperity declining influence. Inflating will give higher interest rates -otherwise nobody will provide capital- and once again a major price rise (on cost of mortgages) for everyone. In resources deficit countries prosperity will decline by higher rising prices than economic growth and by that caused economic decline. In resources deficit countries prosperity can grow regardless their equal confrontation with higher prices, but their economies will grow and that will adapt a lot of the negative influence of prices rises caused by higher energy/element prices.

LESS MOBILITY

The most obvious effect of high energy prices is less mobility. Mobility by car because in almost all cases the energy is used for the 'transportation' of just one person. Therefore mobility will certainly be severely hit by high energy prices.

Mobility by plane also will be hit severely, although the energy costs are 'shared' with other passengers, yet the energy cost per person will by much more higher energy prices still to high for frequent/normal use. Professor D. Honnery (Monash University, Australia): "The car is doomed. Ultimately, we are going to have to move to a decentralized society where most people need to travel far less. People are going to have to fundamentally change the way they think about travel."

LESS TRANSPORTATION

The effect of high energy prices on transportation will be less. In one truck 'travel' a huge number of products, so no matter to what level transportation costs rises by higher energy prices: the cost of transportation is 'shared' with a huge number of products. But by high prices long distance road transport will become much more expensive and will be reduced by market mechanisms severely. Driving the independent truckers into bankruptcy because their capacity is used by transport corporation to fill the flexible area between supply and demand.

LESS TRAFFIC CONGESTION

Less mobility and less transportation will automatically give less traffic congestions. Normally lead less traffic congestion to new commuters, but by high energy prices commuting will become an expensive product for both companies and their employees/commuters. Working in the own home town and they way less cost of earning income or (from company perspective) less costs per employee will become regular.

LESS AIR TRAFFIC

In times of severely expensive energy, air travel and air transportation will scale back enormously. Air traffic uses too much energy related to the prosperity factor. Air traffic will be reduced by less market demand caused by its severe higher prices caused by accelerating energy prices. All air traffic related industries will suffer enormously by Peak Oil. Airports, airlines, plane manufacturers, plane maintenance companies, catering companies, cleaning companies, but also international tourism organizations, hotels and resorts will see collapsing markets with all the (pre) collapse characteristics like lower sales prices, increasing cost prices, melt down of

margins/profits and bankruptcy of all the not on time to this (by energy prices caused) developments.

International business will survive, and even get better by low costs and possible higher contact frequency of videocalling. International tourism will collapse severely and get an other new mainstream direction/characteristic: Less but longer trips, will replace the current more and short trip main market. National and nearby international tourism will grow severely. Hotels that are located in remote area's which aren't reached by national tourism, will be redeveloped as (service focused) luxurious apartment buildings for young elderly people.

SUPPLY INTERRUPTIONS

In the western world supply interruptions are not common. But that soon will become a development of the past. By the high prices stocks will become lower and lower. Governmental policies will be more focused on diversifying in types and suppliers of energy, than on in depth strategic stocks of one type of energy. The long term market will more and more be influenced by the short term severely higher priced spot market.

As in January 2008, both South Africa and China has severe power interruptions. The first thing governments in times of Peak Oil will do is offer a stand still

premium (or just a governmental order) to the major power intensive industries. But if they don't accept that or this isn't enough power interrupts will happen. In South Africa (both a very well developed nation with very strong emerging areas) power shortages are regular part of life and economy. Just Google on power shortages South Africa to see more on this subject. On television may requests to turn of power using devices. Power failures are now 'rationalized' by a city area power cuts rotation scheme. In China there is a severe gasoline shortage, the gasoline use grows there in higher speed oil distribution majors can build gas stations. This results in long rows for every gas station. The new grown foreign oil majors also purchase distribution infrastructures/brands. So is Q8 is owned by Kuwait, Citgo by PdVSA of Venezuela, etc. In times of more demand than supply, these foreign oil majors can decide only to supply their own distribution networks, to gain the distribution profit very easily for own benefit. Any oil major without own -origin nation government bounded- reserves is like a bundle of flowers in a vase: beautiful now, but with build-in short life time.

LOCAL ENVIRONMENT

Local environments are always very vulnerable. Both water, soil and air qualities can be polluted very easily. Well known example: Air quality. In cities in the Western World till the '60ties and air quality in almost all Chinese cities these days the air is so polluted that the sky is one thick cloud always, day after day.

Coal burning and car emissions can pollute air beyond for health necessary limits, which results in less wellbeing and mega rise of health costs. Water and soil qualities can be polluted by bad sanitation infrastructures and polluting industries or agricultural methods.

GLOBAL ENVIRONMENT

Increased CO^2 levels in the atmosphere has two reasons: 1) cutting much of the trees on the earth for increasing wood demand and agricultural area increasing in a short time frame (as in: exhausting the global CO^2 to O^2 transformation capacity) 2) burning in millions of years formed fossil fuels by the global need of energy in an excessively increasing rate in a short time frame (as in: releasing a million years old CO^2 battery). That CO^2 levels really are the engine behind climate change is a

theory, certainly not a proven fact, the sun activity maybe can play an important (and maybe most influencing role), and it also could be a joint development. A certain fact is that CO^2 levels has risen and still rise to not earlier measured high levels and that this certainly influence the insulation capacity of the atmosphere. But as long as we not certain about the cause, we must consider both options and 1) restore the world's CO^2 to O^2 capacity (by a huge think global act local based tree planting program) and 2) stop as much and as soon as we can increasing the burning of fossil energy. The Western Countries are 1) the by ages of tree cutting most treeless/deforested countries of the world and 2) the heaviest burners of fossil energy. Making them the biggest producers and the smallest converters. The Emerging World doesn't like the contradiction in the combination of an own treeless environment and rainforest preaching by the Western World. And they also don't like the intensive fossil energy burning of the Western World. The Western World doesn't like the tree cutting activities of the Emerging World in the Tropical Rain Forests. The PM of Malaysia has made the following statement in 2000: "They don't allow us to deforest 20% of our national soil, although they have deforested their own national soil 95%. Let them go home, plant some trees there and stop with their double moral to the Emerging World". On September 27, 2007 the Minister of Foreign Affairs addressed the UN with the statement: "Recognizing the principle of 'common but differentiated responsibilities', and the sovereign rights of countries to its natural resources, Malaysia is supportive of global efforts towards mitigating the adverse impact of climate change through better management of our natural resources. However, any approach to resolve the problem of climate change must consider the differences between developed and developing countries. Developed countries have already reached a stage in their economic development where they should reduce greenhouse gases emission. They have emitted more greenhouse gases in the past and would continue to do so in the foreseeable future, and have the financial and technical capacity to reduce greenhouse gas emission."

Despite of these 'who's to blame' issues: increased CO^2 levels, declining O^2 levels and maybe thereby caused global warming could have severe consequences. It's not about some degrees higher temperature that could damage life environment in already (near) to hot regions (giving huge refuge problems and major capital losses). It's not about some regions not longer suitable for agriculture (major capital losses and increased food prices). It's not about ocean level rise because water of higher temperatures has more volume (although 80% of the global cities

are former harbor cities and more than 50% of the world population lives in those low laying cities). It's not about declining bio diversity by the new aggressive growers in new situations (like the killer algae in the Mediterranean Sea). It's not about periods with absence of rain (drying soil humidity, destroying flora and making environments severe dustily). It's not about globally destroyed local natural balances by changing local temperatures and humidity, and the destroying of flora and fauna caused by it and by new locally appearing spices. It's also not about severe weather conditions all over the planet (droughts, floods, storms that will damage economies year after year). It's all about melting the possibility that melting ice caps could slow down or interrupt the ocean currents and thereby the global climate conditioner would stop working, making Equatorial Nations much more warmer and northern and southern nations much (really much) colder. Canada and Northern Europe are located on the same latitude as Alaska, but both have severe softer climates by the warmth of the Equator that is brought there by the Atlantic Current. This will also have several uncalculated site effects: For example The European Ale (which is the scavenger of many sweet water environments around in Europe) than could not any longer travel as larva on the Ocean Current from its mid ocean birth ground in the Mid American Sargasso Sea to its life habitats in Europe. European sweet waters than will be severely bacteriological contaminated with other dead fish (which these days is eaten by the Ale). Just a simple example of the many thinkable side effects of Climate Change. Governments of nations that climatically demands on the Ocean Currents should be the driving forces in the global fight against Climate Change, because it will effect them double: Both real Climate Change for them and the economic damages of storms and floods. And in the most negative scenario the earth magnetism polarity could gone change if the ocean current should be interrupted, that will give some years (the polarity changing years) catastrophically weather conditions accompanied with more volcanoes activity (and the atmospherically pollution by that), earth quakes and the by them caused tsunamis. The climate (and the weather driven by it) is a complex of many factors; small changes could lead to mega effects. The number and intensity of storms gets higher and more severe by each degree higher ocean temperature. Climate Change (if the theory will become reality) will cause mega economic damages, sky rocking food prices and a lot of human suffering by catastrophes. Anywhere in the world, both the Western Nations and the Emerging Nations.

SUB URBANIZATION

When consuming and commuting become more expensive the rural areas will gain an enormous popularity increasing. Life is about having a good life by earning an income and making the most of that. That certainly will be more possible in rural areas than in the city. Energy in suburb/rural area's will be much more cheaper by own generation (more roof/wall space per inhabitant). Food will be much more cheaper in suburb/rural areas.

The quality of life will be much more better in suburb/rural area's as they get a more active social and economic life by the increased/enhanced localization development. Single functions (and that are cities) will become less popular. Real estate prices in cities will drop dramatically by the suburbanization caused by the enhanced localization development. Regions will adopt city names to 'spread, conservate and sell' their name value in international business. All companies in France may put Paris (LocalName) on their websites and letterheads, because city names have proven to be a good marketing/imago facet. Cities will be less compact. The compact city development model will be out phased.

WEALTH REDISTRIBUTION

The era since 1990 that the US governments, listed companies and later on home owners could consume the income of other countries has come to an end. Not balanced issues are always ending. The same development that ends slavery, will end US dominance. They screwed up the unique major benefit they have by being the world currency (as in: unlimited currency/credit supply), the global main internet domain (.com) (and therefore the main internet based companies of the world), the main operating systems (truly an act of innovation) and many more beautiful assets by stretching this asset to long to much by forgetting that real economic value is created by production. It's not by coincidence that the USA was the largest consumer of oil in the world. This energy consumption must be imported and waters down (or even swift) the real economic value of the US to the energy nations. High energy prices taxes the wealthy (large quantities of energy using) western nations in benefit of the energy nations of the emerging world. High energy imports are just a huge structural wealth and prosperity leak on western societies. See the OPEC as energy dealers/pushers and the Western World as the energy addicts, stocked in their habits, daily more downed by there addicts and the problems caused by it. Own renewable energy generation closes this wealth drain. This is the reason that right wing politicians will embrace renewable energy even more and stronger than the left wing ideological drive politicians. Renewable energy is no longer a left or right wing issue. It's just about direct stopping wealth leaks for the right wingers, and about further climate change prevention for the left wingers. Renewable energy is no a longer political flavor bounded issue. It has become common sense. When the US Government should go bankrupted this wealth re-distribution would be turned back severely, because than the US would lose their debts and still will be able to keep their assets. Therefore it's more likely

that the financers of the US Government will push the US Government sometime (when funding governmental debts is no longer possible because nobody would buy new governmental bonds) in a Chapter 11 type of situation, where there supply limited money in trade of huge budget cuts. This would be the fall of the US. A gradually erosion of the US is more likely to be continued, than an instant fall of the dollar. The dollar will erode (at a much more higher rate as oil start be traded also in Euros), but not collapse, because the huge dollar positions holding nations will not shoot themselves in the foot by throwing large volumes of dollars on the market.

SOCIETAL UNREST

It's not hard to understand that the by increasing energy/elements prices caused higher prices for products and services (and even severe for food) certainly will lead to more economic and societal unrest. The combination of higher prices and possible supply interruptions certainly to unrest.

Economic and societal unrest is an extra headwind in already dire straits. It deepens problems severely. Economic and societal unrest is the price governments/ societies pays if they don't address the PeakOil (and related) situations by not creating new energy generation and not designing less energy consuming economic/societal models. Societal unrest is a severe problem on top of already existing deep economic/societal problems.

TRADE DEFICITS

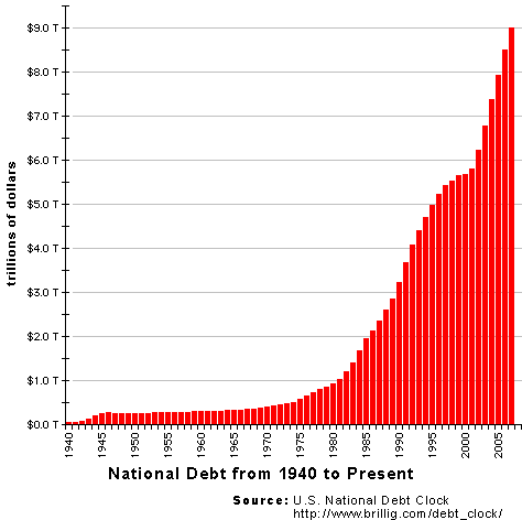
When oil/energy prices rise trade deficits rise with them. This will boost imbalance in the already very imbalanced trade deficit of the USA. On 300 million US population there are only 10 million people employed in manufacturing, this is a severe problems indicating figure. Where consuming becomes more important than manufacturing nations will face future dire straits. Holland her leading role on the global economy ends when they start to finance the UK industry with their by trade earned capital. The US economy is 70% based on consumer spending, boost by yearly increased house prices (the housing bubble) and fund by the whole world. The housing bubble has collapsed. Saving has become hip again in the US. People cut their creditcards and start using debitcards.

Stopping with loving honest and good manufacturing has a deep mental colonial and/or racist background: Something like 'let the stupid other nations work for us, they're not smart enough for our high developed technologies, finance models (yes right, they have giving us sustainable wealth…) and organization models'. But this is a misconception: Education in India and China delivering each year as much engineers as the US or the EU has in total. There is no knowledge gap any more. Certainly there is a mental gap (looking up to the Western World), but this mental gap will have its polarity change when the Western World can't afford it wealth anymore.

GOVERNMENTAL DEBTS

The US government has in February 2008 $ 9.300.000.000.000 in governmental bond debt (http://www.brillig.com/debt_clock). When liabilities and unfunded commitments of recent signed (elderly retirement bill and elderly healthcare bill) bills are taken in consideration, the federal USA debt is not $ 9 trillion, but even $ 46 trillion. Due the fact that the babyboomers starts to retire in the next years. This statement is not of some left or right wing activist, but is the statement of D.M. Walker, the Comptroller General of the United States of 1998 till 2013, as head of the US GAO (Government Accountability Office) which recent alarming address to the nation that has been nation wide broadcasted is also published on YouTube (http://www.youtube.com/watch?v=KjZBOCAgR64). He calls it immoral to our children and grandchildren to give the future double income US household as he call it 'a mortgage size debt without the use of the house' of $ 750.000. The by his in this address mentioned calculations are based on the year 2005 figures and things has gone severely deeper since than by the increasing cost of the Iraqi War. When PeakOil hits the US economy these problems deepen once again severely more, because IRS (the US Tax Agency) revenues will severely drop and governmental budgets at the same time will rise enormously by higher energy, element, product and service prices and much more unemployment. An example in recent history of a federal state that has gone bankrupted by excessively governmental spending, wrong credit models, wrong taxation model, wrong corruption model and combined with wrong production models and an inefficient economic model is the collapse of the USSR in 1991. The US Governmental Budget for 2009 is $ 3.1 trillion on a GDP of $ 13.9 trillion (estimated 2007 value). The governmental debt grows $ 1.58 billion a day, which is much higher than inflation rates. Capitalism can collapse also. Collapsing is about balances, it's immune for that fact that the capitalistic model is the best productivity model. Also right been proven models can collapse by wrong management. Capitalism (although it superior to communism) can also be poisoned by wrong governmental, financial and corporate management.

It's all about the best way to earn prosperity in freedom and keeping the books in balance. Unbalanced books combined with PeakOil lead certainly some time in the (near) future to Martial Law, and Martial Law is not about the Constitution, not about an open democratic society and not about general prosperity.



Western Capitalism these days certainly also needs it Glasnost and Perestroika and national and regional and local leaders worldwide of the size and with the attitude of Mikhail Gorbashev, Margaret Thatcher and Ronald Reagan. Otherwise the future perspectives of the Western World by going further on these ways of energy consumption and credit consuming will bankruptcy will all its attached problems. We don't need Martial Law solutions (weak leadership followed by extreme leadership), we need preventing collapse solutions (good policies carried out by all of us). The Western World needs the 'don't follow leaders, be one' attitude again, this used to be the capitalistic/western moral and the basic of the western governmental, corporate and societal structures.

SMALLER GOVERNMENTS

By the global wealth redistribution caused by the resources 'taxation by free markets' the economies of the former wealth nations will shrink. Extended and always growing governments (keep on growing is a characteristic of government) can only be feed/funded in growing economies. Shrinking open society based economies have no mercy for over stretchiness of governmental layers. Governments of shrinking economies have two options: adjusting to the economic levels of their economies or totalitarian and/or fascism. Governments are both a blessing as a curse for economies. Wise governments knows to find the small right line between those two and bring maximal (possible) prosperity to nations, by steering all developments in the best direction. As said: governments are the steering factor of economies, human capital, financial capital, agricultural production, advanced services, tourism, technology, trade and resources to motors. Governments that don't steer, over steer (over regulating) or trying to become also the motor, severely damages their economies. When local economies became more imported by the enhanced local solution, local governments will gain more influence. Econo-

mies under pressure will (by less governmental income) have severe smaller national or federal governments. Governments will fade away from the economy as motor, by the decline of their financial power. Governmental income is based on 1) taxation (less economy, less taxation) and 2) funding (less good economies, less funding budget shortages). When 'societal unrest' by the effects of economic decline even become 'societal turbulence' being government than is not easy. Maintaining free open societies driven by democratic governments will be the challenge of the governments of the declining economies. Dire straits ask for gifted political leaders. Totalitarian or fascistic 'leadership' are the dangers of those times. This is the reason why the need of transition has a political aspect: no transition is economic chaos and thereby human suffering and will give too weak governments or just the opposite too strong fascistic and/or totalitarian governments.

SOCIETAL TURBULENCE

Economies certainly will collapse when governments don't anticipate on PeakOil, when they don't changed their energy supply, installbase, conservation, processes and economic models, economies will be destroyed. Rising prices and smaller governments that has no adequate solutions (enhanced location policy is the only on the way cure) will lead to more intense societal unrest and even to societal turbulence. This could be the sparks. As Albert Einstein wisely has said: 'an empty stomach isn't a good political advisor'.

Governments can be forced to react offence wise. Leadership that can manage that within an open democratic society will be scarce. Social turbulence will lead to anarchical, totalitarian or fascistic governmental models. Inflation is often called the hidden tax. Civilians and companies accept inflation in times of economic growth (when incomes rise in the same rate), but certainly don't accept it in times of economic crimp/decline. The economic (and therefore the societal) impact of negative growth is enormously. This will be the huge headwind ambiance for the Western World. Losing wealth gives severely more stressful societal ambiance than gaining wealth (which is the ambiance of the Emerging World). The use of Martial Law will become a real danger in these days. Taking the whole Constitution (temporarily) completely out of order, by replacing it by absolute/mono power of a non democratic military government and thereby ending all civil rights.

CORPORATE REDISTRIBUTION

The rising prices of energy and elements not only will change (re distribute to other positions) the wealth of nations, but also change the field of big market players. The former oil majors are good examples: In the '70ties they controlled 70% of the worlds proven reserves, today only 10%. All producing nations has formed their own oil majors and after that re-open the (already closed) contracts concerning ownership balances or (like Canada has done) by additional (more profit with the government sharing) taxes. Resources wealth stays more and more within the producing countries. A development that's still further growing and is caused by the market polarity change of demand that outstrips supply more and more. Exporting the resources is not their concern (buyers enough), exporting the wealth to be made on these resources is something or the past. New giants are born (also due the increasing home markets) and they are very big very soon after birth.

For example: PetroChina has her IPO in 2007 and was very soon after the IPO the most valuable company of the world in terms of exchange stock value (above $ 1.000.000.000.000, double of the Exxon Mobil $ 500.000.000.000). The western oil majors their market share declines every year, not only by the grow of the market watering, but also by their own volume declining.

CORPORATE BAILOUTS

After the first Oil Crisis, the OPEC countries became in rapid speed very rich in the '70ties. They had huge capital surpluses and brought these loads of capital to banks in the Western World. Because the domestic capital demands where to low these banks lend this money to Latin American countries in to big volumes. The value of capital was to less for these countries and they invested these loans not economicly and we're not able to start repayments or even pay interest. This lead to the global banking crisis early '80ties. Banks than had to write down large losses on these loans. These days the OPEC countries (and other emerging hardworking countries like Singapore and China) have ones again a huge capital surplus, but they have learned their lessons of the early '80ties. They have build their own banks that hold their own capital. Again a market polarity change issue feed by PeakOil.

Many of these often called Sovereign Wealth Funds sees the current subprime crisis in the financial world as an opportunity to purchase first minor, later on controlling positions in western banks. The western banks are silently more and more owned by emerging countries. The emerging world hereby gets financial brands, financial structures, financial knowledge and of course a billion new customers. The western banks will get different policies by these new ownerships: more global economy minded than pure nation's / customers interest focused. By enough market share in a market the new owners can adjust the economic behavior in that market by limiting money supply by credit. The neighbor than has become the real boss in the house. For chipmakers as AMD and many software companies these corporate buyout giving them new power to gain larger market shares with improved products. SCO is the latest example of these foreign corporate bailouts.

EXCHANGE DIVERSIFICATION

Iran (the second largest provider in OPEC) is the first fossil energy producing nation that has started (on February 17, 2008) its own internet based oil/gas bourse and exchange in the free trade zone on the Persian Gulf Island of Kish.

The Iran Oil Exchange (there is no official English name given) must compete with the old two centers of fossil energy trade the ICE in London and the NYMEX in New York. The main difference is that on the Iran Oil Exchange trades can be made in any currency accept US dollars, while trades will be preferred in Euros. This gives investors the possibility to hedge oil against other currencies than the dollar. Iraq

changed in 2000 also to the euro, but this was switched back to US dollars after the invasion of the USA in Iraq in 2003. Many others OPEC and non-OPEC members will follow the Iran Oil Exchange example soon as result of the market polarity change. Venezuela certainly will be the next OPEC member that will open its own Oil Exchange with trade in other than US dollar currencies.

Russia also has a historical problem with US hegemony and also will start its own Moscow Oil Exchange. The Russian Government is not forgotten the from 1988 till 1991 during USA/Saudi managed global oil market oversupply, who lead to the financial collapse of the USSR and also from its smaller and its less federal dominated but quickly failed or even never from the meeting tables erected successor Commonwealth of Independent States. In Norway there is also already discussion ongoing about the opening of an own Oil Exchange linked to the Oslo Börs or to Nordpool (the Scandinavian Power Exchange) which will also only trade in Euros. By than the London based ICE and the New York based Nymex (with their declining market share) will open their systems for trades in other than US currencies and the dollar will lose its hegemony in the energy market. As the economy moves to resources production nations. Later on the world's major regular stock exchanges will be also their, causing an irrefutable decline for the two current major financial centers of Wall Street and the London Financial City District. Dubai is steaming forward to this position at rapid speed.

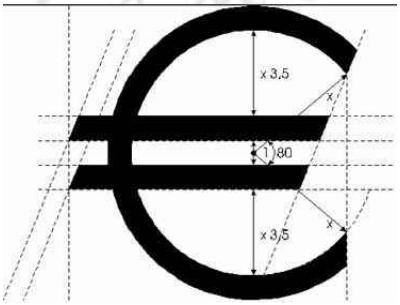
CURRENCY DIVERSIFICATION

The US dollar has been the currency of international trade since the end of the Second World War. Making the USA a global economic and monetary empire. A nation-state taxes its inhabitants and companies. An empire-state taxes connected nations. Having the leading world currency is the most attractive way to tax the world in a complete soft way by money supply, credits trough inflation. The so called Bretton-Woods Agreements, which are signed by 44 countries in 1944 in Bretton Woods in New Hampshire USA, had make the US dollar the post war world currency. America would keep the golden standard and all nations the dollar standard, making the dollar 'as good as gold'. Nations were allowed always to exchange dollars back for gold. But the dollar became severely overvalued by the US her expensive (external -Korean War, Vietnam War and the Cold War- and

internal -Great Society-) 'war and butter' politics and got its first time trade deficit and severe larger governmental debts.

Wars are capital drains: were, are and will be. Governments that forget that they are the steering of economies and thereby act as they are the motors hurt their economies severely. That this trade deficit happened was logical: unlimited availability to capital and/or purchase is equal to using it in lending and/or spending. This enormous purchase power of the USA was caused by the voluminous demand for foreign currency backing dollars and the growth of the global economy. In the same time the bad global public relations on the Vietnam War undermined severely the positive attitude of the world toward the USA. When nations started too many dollars back for gold exchange requests, the US Government defaulted on its payment on August 15, 1971, because they only had left 22% of the exchanged foreign currency in proven gold reserves left by excessive spending behavior. Better stopping payments by choice than by complete insolvency was the thought behind this decision. And also the concept that capital from abroad must run into the USA and not out of the USA. This denial of paying back gold for dollars can be seen as an own act of bankruptcy of the US and lead to the first Oil Crisis (in that period supply of oil was not the problem, dollars where the problem). In 1972 the US government made a life time deal with the Saudi Royal Family that oil only should be trade in US dollar in exchange of protection of the Saudi Royal Family. By the enormous rising oil consumption and oil prices the demand for US dollars started a run till 2008, without the golden ceiling of volume restriction. Giving the US the possibility to create a federal (state and municipal debts not mentioned in this calculation) governmental debt of 12% of the GWP (Gross World Product) and create huge a still growing trade deficits. The US could finance both their municipal, state and federal governmental budget deficits and their trade deficits by this enormous global demand for dollars.

The Open Market Committee of the FED even can used digitally generated dollars to buy governmental bonds to keep the market prices on desired levels, or even influence stock indices by supporting purchases. The FED ceased the publication of M3 figures (money aggregate as in: money creation), large-denomination time deposits, RP's (Repurchase Agreements) and Eurodollars, on March, 26, 2006 (http://www.federalreserve.gov/releases/h6/discm3.htm) for 'these figures weren't as independent figures statistical valuable anymore'. The dollar has by the US/Saudi deal of 1972 become the leading currency in energy trades till 2008. But these times are changing. Due to the market polarity change caused by PeakOil. Although the ICE (formerly called the IPE) and the Nymex have US based owners. So the market polarity change will have also impact on the used trade currencies. By this the dollar reserves will be lowered and the funding of the US municipal, states and federal governmental debts will become much more harder as the US is not longer the main economic power with the main economic currency. This will not be an easy development for the US, because their debt build-up is based on the giant US dollar reserves everywhere in the world.



The current ongoing currency diversification in energy trade away from the US dollar will take the US government and the US domestic banks a lot of wind out of the sails. When the energy/oil trades (as being approximately 10% of the global total GDP, also called GWP -Gross World Product-, and increasing rapidly to at least 15% end 2008, at least 20% end 2009) doesn't longer backup the US dollar, the dollar would erode in much more sever speed than it has done last years. This value reduction of the dollar will be a tailwind for the USA: it reduces their external debts severely, because the US federal, state and municipal governments, banks and companies only have debts in US dollars. Market polarity changes leads to changes in used currencies and thereby will give new leading currencies. Currencies are about inflation, an inflation is about money supply. The metal value of US

nickels and pennies has over rised their currency level with more than 40%. Therefore end 2006 legislation has been installed that melting or exporting nickels and pennies made illegal. But the worst sign is that the FED has ceased to publish M3 data since March 26, 2007. M3 was mid '90ties 'only' 50% of the US GDP (Gross Domestic Product), when M3 data publishing was ceased it already had grown above 100% US GDP (one year gross domestic product) thanks to Mr. Greenspan his money printing policies. The dollar is severe (maybe terminal) ill.

As stated earlier under the Wealth Redistribution header: The financers of the US governmental debts will force the US federal government in to a Chapter 11 type of scenario. This will happen when there will no buyers more for US Government Bonds, which place the US in the direct state of 'not being able to pay current expenses' as in technically bankruptcy. The foreign financers of the US will take over the FED, limited money supply severely and insure their repayments at the cost of future US life quality of current and next generations. Greenspan, Bernake and the names of the presidents that cause the huge debts will become the curse words in the US. A more likely scenario (and much more better for the US citizens and companies) is the bankruptcy of the US Government by first the devaluation or replacement of the dollar. This would clean up the foreign owned US governmental debts overnight, while keeping all the assets. This will cause huge economic damage all over the world; stop the re-distribution/export of wealth.

But also would be the end of the federal government of the US. Lenin has done the same with her Bolshevik Policies since 1917, of which 'abolish all state debt' and 'nationalization of foreign assets' was a part. Beside the fear for socialism and communism this were the second and third reason why the USSR Government than had less positive foreign relations. The Bolshevik Administration had ripped of any investor in Russia and caused huge capital losses around the globe. It forced Russia in to isolation. They same will happen if the US Government would replace the dollar and cause huge (deeper than deep) economic damage around the globe. The willingness of states and companies to have relations and doing business with USA

2.0 will be low. Most likely USA 2.0 will have a short life time and separate states will become independent nations. The end of the USA as federal state will be the huge global political lesson that when the distance between government and its civilians is to wide, governments always will malfunction by huge budget deficits, excessively money creation, military over-stretchiness, impregnated corruption and monotone leader ship. The last facet (monotone leadership is a severe treat to a nation's vitality. When a president's son becomes president, and when a president's wife wants to become president, you know structures of monoculture are ruling above diversity and quality. When this applies for the presidency, what will be the status of woven in lobbyist's activities? States like California (with 17% of the USA GDP and being independent the seven largest economy of the world) maybe will decide that they can survive better both domestically and internationally without the burden of a federal government in huge debt turbulence, certainly when energy sales have past on from only market mechanism to also the granted type of distribution on top of it. And this vision maybe will grow in many other states: it's the clean way out the federal USA debt for all of the 50 US states. No foreign relation request will not be rewarded in this scenario, and trade can continue. Although the economic damage all over the world will be gigantically. This vision is not Anti American, it's the most realistic Pro American vision possible in a by irrecoverable governmental debt drowned situation.

GEOPOLITICAL CHANGES

Consumption must have an economic wealth production source, otherwise it has no roots. With out roots it's just eating its own future or third party their future and that of course doesn't stand for long. The emerging countries produce real economic values: products, energy, elements, fertilizers and food for the western world. And they get wealthier day by day. After subprime almost all economists are convinced that the emerging countries finally will own the huge stock listed western banks and companies.

When the US can not longer finance their interest payments and new budget deficits, the 'banks' will become in charge. Forcing them to take all the measures the World Bank in the past had forced countries in financial problems to do so. But this time it will not the World Bank (an institute of the past, which may be will reinvent themselves by the energy crisis), but OPEC or China who will decided what financial measures must be taken by the US government and which leaders have

their trust, otherwise they will stop financing. This is not a far away scenario. End of February 2008, some local governments were not able to finance their needed capital. The US will get a huge backfire of their more spending than earning model. Such a model has a limited life time and was based on global supply of and demand for US dollars. But this also will become reality in energy, elements, fertilizers and food. There are certainly levels that represent the maximum price of a product, when a price get higher, the market for the product implodes because to fewer buyers than can afford that prices. So first to by supply and demand driven market prices mechanism will work, but that mechanism has the before described maximum price ceiling. After maximal stretchiness of the price based market distribution mechanism, an additional market distribution mechanism will be grow on top of the supply/demand price based model and that is the on granting or allocating based model: sales will be narrowed to just the friendly nations (of course still for the product specific maximal prices). The geopolitical balances of the world will also under go a polarity change, only several years later than the market polarity change. The nations with a lot of debts, and/or current budget deficits, and/or no own energy resource, and/or no own element resources, and/or fertilizer and food import needs, and/or not energy efficient, and/or no element efficient, and/or has no fertilizer replacement will become completely depend on their goodwill of the nations which are willing and able to provide them capital, energy, elements and food. Beneath oil, of course elements, agricultural area, deserts and the sun are the key national economic values of the future. The OPEC countries will have (by their high natural resources and low population numbers) in the near future the same in terms of wealth more consumption than producing attitude the US and Europe characterize the last 25 years, till the resources are sold out and they have got their time in the economic sun. Nations like Russia, Nigeria and Venezuela has some severe problems to address before their economies/societies have a stable wide middle class prosperity.

INTRODUCTION

Dangers are the very high impact issues that maybe can happen in times of PeakOil (certain development) and Climate Change (possible development) and certainly will cause severe/huge economic damage or could even destroy whole national economies. These possible dangers (if they occur) than will happen in already by PeakOil caused economic, societal and governmental dire straits. If they are guided by suddenly events (sparks) they could even lead to regional or global wars.

PEAKOIL DANGERS

The certain (as in: 100% certain) effects of PeakOil are clear to everybody who just take an evening to research, analyze and think about the consequence of first severe rising energy prices on the economy till carbons will become to expensive and create a post world after carbons are depleted or no longer used. This report is a good starter for your own research on effects of and therefore dangers caused by PeakOil. The effects of PeakOil are severe and could generate serious damage to economies and therefore to countries and the people who live in them. When PeakOil not is address it can lead to a collapse of the world economy and a world that only can support 2 instead of 6.7 billion people. PeakOil without adequate response is the end of the world/economy/society as we know it. Not addressing PeakOil is a spill of lives, economies, governments, nations.

CLIMATE CHANGE DANGERS

First we address the possible Climate Change attached dangers, because they are (if they should happen) severe and could be create a situation in which we could have an (dire straits)^2 global situation. The maybe (as in: absolutely not proven yet, and certainly still yet disputable) effects of Climate Change can also be analyzed in just one evening on Google and YouTube. The chance on Climate Change is maybe overrated, but the effects of Climate Change (if it should happen) are severely underrated. Climate Change (if it should occur) is on massive economic destruction on global scale. Climate Change is certainly not about some degrees more attractive and relaxing higher temperature on land (but some countries near the equator are already on their for human beings, flora and fauna maximum temperature, and the Sahara Region has already oversized that line).

It's maybe also not about some sea level rise (water has by 4 degrees Celsius its most compact volume, colder or warmer its volume increase) which is a local problem for a few low landed countries and also for many of the major sea border located world cities who are historical developed from low localized harbor cities, unfortunately this is the case by 80% of all the global metropoles, which home 50% of the world's population and economic centers. Climate Change is also mainly about the risk that the ocean currents stop (making the equator region much more heater and the north and the south severe colder) and also the possible impact of that on the earth polarity. There are two 'pumps' on the ocean currents: 1) cold water is more dense and therefore heavier, and 2) water that becomes ice on the poles has no salt, leaving the remaining water more saltier, salt water is more heavier. These two facets are the pumps of the global airco that the ocean currents are. Climate Change is therefore about more heath in the tropics, less warmth in the northern and southern parts of the world and therefore mostly and globally about more heavy storms, rains and droughts (with al the severe economic damages of it) all over the world. Climate Change is also certainly about to much or to less water. Climate Change is not a consumer weather consuming problem or an environmental problem, it's an ecological driven economic problem that can cause severe regional political problems and geo political problems.

EARTH QUAKES AND TSUNAMIS (NOT PO, NOT CC RELATED)

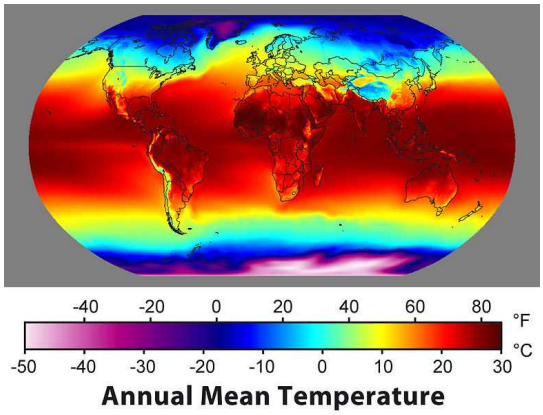
There is no connection known between Climate Change / Peak Oil on the one side and big earth quakes / tsunamis on the other side. Maybe the extraction of oil and gas will cause some minor earth quakes (recently again in the UK), but they are too small to cause tsunamis. But earth quakes and tsunamis have always been happening and will be happening. But there is difference: By the media and the globalization of them we see them (very soon after they have happen) on our televisions CNN. Earth quakes and tsunamis have always happen and will also happen in a CC and PO influenced world. If the ocean currents stop, this could have influence on earth quakes, but the earth surface is formed by the earth subsurface and not the other way around. Still earth quakes and tsunamis will happen, also in the next 10 or 20 years, when we 'don't have really time for them' due to the effects and dangers of PeakOil and maybe Climate Change.

POSSIBLE SEA LEVEL RISE (ONLY CC RELATED)
Water volume is the smallest by a temperature of 4 degrees Celsius, higher temperatures expands the size of each water molecule. When ocean temperatures rise, therefore ocean volume rise. Almost 80% of all global cities are harbor area location born are by that build on low lands. So sea level rise is not just a problem of low land nations like Bangladesh, Belgium or Holland.

It's a problem for currently 50% or the global population who lives in these sea border cities. We know the volume expansion of salt water per 1 degree temperature rise. We don't know the depth impact and gradually downgrading factor of the warmth, so any calculation has 1 fact and two wild cards, making any calculation complete a virtual guess. But it's a fact that sea levels have been risen and fallen. But we don't know if this was an influence of the drifting continents development, of sun level activities, passing by gravity in space or CO^2 levels. The Climate Change theory has some severe wildcards, we must not forget that. And: PeakOil is not a theory: it's a mathematical and historical fact.

HEATHS AND COLDS (ONLY CC RELATED)
A slightly warmer earth atmosphere could increases weather intensity, making it more extreme. If the earth's temperature could be warmed by mankind is still a matter of (on both sides not very rational) discussion. Therefore it's good to look to both sides in this discussion, because the impact of this subject is beyond imagination. That weather conditions should gain intensity and gets more extreme by each degree in rise of ocean water is something each meteorologist certainly will underwrite. That the ocean currents the oversupply of warmth of the equatorial regions transport in the directions of the north and south areas of the world is something each oceanographer and meteorologist certainly will underwrite. That if the ocean currents will stop, Northern Europe and North East USA and North East Canada will have the same climate of Alaska (both are located on the same latitude/height) is also something each oceanographer and meteorologist will underwrite. The issue on which both sides have severe opposite opinions is: 1) is there a temperature rise happening from historical perception? 2) if so, in what intensity?, 3) is the weather become more extreme from historical perception? and than the main subject of disagreement: 4) is this caused by CO2 increase in the atmosphere due deforestation and 50 years intensive fossil fuel burning (and increased population numbers) or is this caused just by sun activity cycles. The truth could be found may be somewhere in the middle, but Climate Change has

become a religion and this doesn't support open exchange of data and visions between scientists.



Water is one of the substances on earth that adapts much warmth before it temperature rises 1 degrees. This is why the Ocean currents are such major climate influences: they adapt huge warmth volumes in the equatorial Regions and transport these huge warmth volumes in colder parts of the world. Cooling the equatorial regions, warming the northern and southern regions of the world. The ocean currents have a top stream and an opposite flowing downstream. What ocean currents 1) has started, 2) still powers and 3) could interrupt, is subject to a lot of theories. One of them is that the pump mechanism is located on the poles and is based on the density difference (and thereby weight) van cold and warm water (when water becomes colder it 'sinks'). The climate change theory says that the melting of the poles (the North Pole seas will be ice free during summer months as soon as 2013 scientist thinks) will disrupt this pump, if this is the case we've passed point of no return. But there's a lot of scientifically resistance to this theory. Other theories thinks that rotating magna cycles between earth's surface and nuclear inside the earth power them (but we have very limited knowledge about the magma cycles). Other theories say that CO^2 acts as an insulation layer in our atmosphere: keeping earth warmth on earth and block the warmth convection to space. Yes, we have a lot of CO^2, we burn millions of years fossil fuel (oil/gas/coal) in just 50 years into the air, we have deforest the world the last 100 years in levels never seen. Reducing the use of fossil fuel and reforestation (planting as much trees as possible anywhere) would be two wise things to do. And yes, let's not talk about it, but do it. Burning less fossil fuel is difficult in a world with Emerging Nations, the prices rise and new energy technology caused by that will contribute, but planting new trees is simple. Each government should turn the CO^2 discussion in a tree planting plan.

WATER OVERSUPPLY (ONLY CC RELATED)

More extreme climate means more heavy rains. Heavy rains can cause small or big floods. Murphy's Law (if something goes wrong more things can go wrong) is certainly applicable for floods. If heavy rains happen in a wide area simultaneously with high tide on sea and strong towards the coast winds (so that the rivers can't flow waters to the sea), than levies and dikes in some cases can not hold the

weight of the risen water levels and elapse, flooding the dry lands behind the dikes. If the upstream water holding capacities are reduced by deforestation of mountains and hills and by this caused erosion, and rivers are canalized in more straight lines for transport reasons the downstream area gets water from four directions (upstream, downstream, sidestream and rain) and this multiples to risk of floods. Up stream floods are also caused by erosion caused by deforestation. High ocean tides are of all ages: they occur as the moon is in the same line seen from the earth, then the gravity forces of both join together on the earth, creating little more 'oval' shape of liquid surfaces of the earth (read: oceans) and creating high(er) tide, than the moon on its own does every day. When high ocean tides, storm, actual rains occur (and by former rains the inland water levels are already high by rain in earlier weeks) problems could disasters can occur. Floods destroy everything that they pass on their way. Floods cause huge economic disasters both for not insured people/companies, under insured people/companies and insurance companies. Floods always take also not small numbers of human lives.

In August 2005 the hurricane Katrina has destroyed almost the complete city and suburbans of New Orleans, Louisiana causing huge loss of lives (over 1300 people) and tremendous economic damage. The State of Emergency is more than 2 years after Katrina still effective in New Orleans.

WATER SHORTAGES

There are four possible reasons for water shortages: Droughts (as in absence of enough rain), increased use (more agriculture, more people, more prosperity), pollutions (upstream located industries) and contaminations (no sewage, direct sewage dumps, sewage over supply dumps in times of heavy rains and total floods that contaminate clean water supply -like is happened in New Orleans-). Water is equal in importance to food; it's even the most important/needed food type. Water is also important in terms of hygiene and thereby for personal happiness and social structures. Water shortages will lead to severe societal turbulence and drifting of the populations of complete area's/regions. New research shows that there are offshore underground sweet water reserves under the sea nearby any costal area. These certainly will be explored, but because this is an one time supply, the investments will be write down in very short time, making this water not cheap. The best way to fight water shortages is decentral solutions based on roof rain water cleaning/storage, waste water purification/recycling and limited surface and groundwater use.

WATER POLLUTIONS

The situation of the Great Lakes is a good example of water pollution. These Great Lakes, could supply sweet water to half of US and half of Canada, but the water is too polluted to being used for this. The pollution of the Great Lakes could become a major threat to the wealth on North East America. Terror acts of water pollutions are possible in case of huge urban population concentrations and the connected concentrated large water infrastructures. Terror can be fight by undermining civil rights. Terror can be made much more difficult by designed redundancy in the needed large supply structures. Terror can be eliminated by the decentral design of PeakOil solutions. The enhanced localized PostCarbon world will give unemployment for terrorists. Fighting terror is not an army issue. It is a technological design issue. In China there's a water shortage of two natures: 1) sweet water shortage (related to the number of people) and 2) clean water shortages (in many cases there is water, but it's polluted or contaminated and there by not suitable, even if it's there).

WATER CONTAMINATIONS

When water sources are contaminated population gets sick, societies will collapse and the population of regions start drifting, even when the contamination is temperately. The decentral water policy will prevent such problems. Huge central monoline solutions in water supply are a huge economic/societal risk and should be avoided. Complete regions that depend on one source is just bagging for trouble to happen. In too big infrastructures with no supply diversification, just one fast growing algae could cause than the collapse of a society. Floods also can cause water contaminations.

Iraq has some severe water contamination these days by dead/wasted bodies just thrown into the Tigris. The water contamination of the Ganges by sewage dumps is known for decades. In the Western World huge sewage systems investments have clarified the surface waters. But these sewage systems are getting old, the leak severely contaminated water into the very valuable (during age purified) soil water reserves, which could make the exploitation of them very expensive. Water contaminations are no longer a dedicated Emerging World problem. If the Western World doesn't address their sewage leakages they face also water contamination problems. Addressing sewage renovation demands very huge investments and

should be done simultaneously with fiber network roll-outs. Climate Change is also a big danger for possible water contaminations. Floods waste/pollute any available clean water for long times.

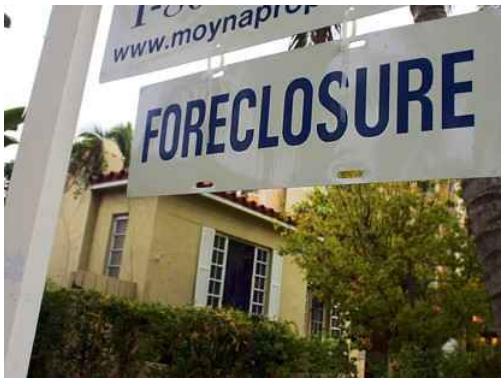
ECONOMIC REFUSES

Floods, temperately or permanent droughts, drying of rivers, long lasting water pollution, water contamination, sea level rise, ethnic conflicts and war can cause direct temperately or even permanent movement of large amounts of people. People that leave everything behind and start drifting to less worse places. This is one of the biggest dangers of Climate Change: complete nations on the run because life circumstances are getting below liveable levels due to some climate change. But PeakOil also has drifting nations potential. When energy, water and food become scarce and very expensive, the upper and middle class are the first that will considering moving, just because they will still have capital for moving to better places. This will be the orderly part of economic mass migration and they will be welcome in their new living location. But when the poor starts drifting, this certainly will give huge problems. Both for the economic refugees, as for the involuntary adapting areas. The world could help when this happens accidental, the world couldn't help when this is happen at large scale. Climate Change and PeakOil (seen widely as in high energy, high water and high food prices) are developments that can ruin complete economies. Energy deficits, water deficits and food deficits are not the right ambiance for a stable economy/society/household/life. Energy deficit nations face one huge challenge: solving their energy deficit. Otherwise the economy and society as they have right now is not sustainable within 10 years from now. Ireland is a good example: due to the implementation of a potato based monoculture based agricultural system its population could grow tremendously. Potato monoculture leads to a variety of different types potato sicknesses which cumulative leads in 1741 to the start of the Great Irish Hunger in 1741 that end that period of prosperity, reduces the population with 25% and hit the Irish economy so severe that it needs decades to recover. It causes such a societal unrest that even today still is actual in the IRA movement. It's the reason why almost every cop and fireman in the US has Irish roots. The exceptional good thing in that period of history was the availability of a huge continent with major opportunities and no restricting immigration authorities. Something that's no longer available for today's modern economic refugees. Just try to get a business visa for India and you know that orderly mass economic refugee waves are not any longer possible.

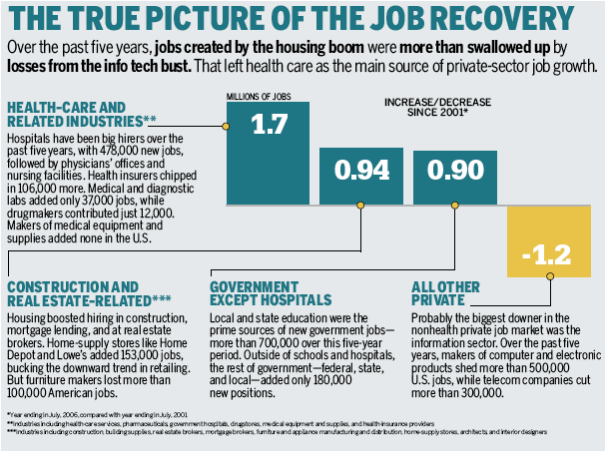
One visit to the US/Mexican border will tell you the same. On the other side: The city counsel of Amsterdam advertised in the 18th age in the yet started newspapers in France and other countries that merchandisers and manufacturers (of religious minorities) were welcome in Amsterdam as city of freedom, trade and manufacturing. High quality (capital and/or knowledge) economic refugees are always welcome everywhere they want (it only takes some time). But the middle class and lower class parts of society just have only one option: drifting. The Mediterranean Sea as the natural African / European border it today one of such drifting areas, but this will change as more dark clouds cumulative gathers above the European Economy. Drifting refugees will be a huge problem between nations in the Emerging World. Both middle class orderly as lower class real drifting waves. Certainly the Emerging World will have its wealthy and its desperate area's and nations. As certainly floods have caused drifts, will water shortages cause drifts. And the same is applicable for energy or food shortages.

COLLAPSING ECONOMIES

PeakOil really can hit economies that haven't anticipated on it. When oil leaves an economy before an economy leave oil that economy will collapse entirely. People that find this incitement should consider what should be become of their economies when oil/gas/coal prices get skyrocking high by the simple market mechanism of supply and demand (by external causes not controllable and irrevocable inflation, which leads to negative growth as in economic crimp). And also should consider what would happen as the granting distribution mechanism (only selling to friends) will be put on top of market mechanism (actual supply shortages and delivery interruptions, which leads to huge economic damage of already wounded economies). For the Western World is PeakOil a possible huge disaster, a threat never seen before. They are the most voluminous users and therefore the most addicted to cheap oil: there economic system in build on it. The Western World has also an other problem: PeakOil reaches the Western World just as obsolescence has beginning to burden their economies. The burden of obsolescence of the babyboom generation takes a lot of vitally out of the western economies.



PeakOil reaches the Western World just as they have lost much of their former comparative ship that has made them to what they are. The Western World misses the enormous vitality of a young generation that are determined to make their live tomorrow better than today. The drive of the human capital of the Emerging World is much (really much) higher than in the Western World. The Emerging World can gain prosperity, the Western World has lost it vitality: the ones with drive are contented. Why fight hard than? The Western World doesn't like working and gaining as much as the Emerging World likes it. The premium of gaining is better that the premium of maintaining. By PeakOil (on top of other already existing developments) the Western World will loose a lot of her prosperity. Loosing is much, much more difficult as gaining. Gaining gives mental power, loosing demands/costs mental power: the loosing process that al least 50% of the potential power in a society. This mental status is very important. The Western World needs also due to PeakOil to change its installbase (with all the connected major write downs). The Emerging World is able by their growth, just to buy direct the right PostCarbon installbase. The Western world also has also a disguised world perception due to colonialism. The general attitude in the Western World is a little bit arrogant and disdainful to the Emerging World. Feeling the better one is rather dumb when the other one is getting each day cleaver and richer each day. The Western World is loaded by debt; the Emerging World is loaded by capital. Russia just pays off her foreign debt. In cash. While the Western World is heavily repressed by governmental and household debts and not genuine figures of banks, bond insurancers and pension funds due to the US artificial bubble, the Emerging World is diversifying away from the dollar and cash and just buys up / take over western public listed industries in trouble for 25% of their value of a year ago. The Western World is lazy, arrogant, spoiled by prosperity, addicted to oil and loaded with debt. Not the right shape to enter a really tough period as PeakOil is. Skyrocking energy prices and major write downs on installbases.



The Western World has had three decades of severe economic sun. But the last decade seems to be the sun, but in fact was just creating a bubble, with no real economic value beneath. This crude reality will hit western societies severely as the price of this last economic fake decade will demand its toll. Pumping up house prices by an increasing trade deficit is major economic poisoning on receipt. But the Emerging World has also their problems. A nation like China certainly has a huge and severe collection of energy problems, water problems and food problems. The only difference is that the Emerging World has or capital or credibility and that their population is on an economic way up instead of on an economic way down. All transitions, so also energy transition, water transition and food transition are all possible by the combination of technology and capital. PeakOil will lift prices of each product/service world wide. Mobility and transport will certainly become very expensive, but PeakOil driven price rises don't stop there. The energy factor or component of each product and service will be clear in the next years. This price rises will in the Western World not be covered by economic growth. In the Western World PeakOil will lead to negative economic growth (as in a vicious down headed circle of less profits/jobs, less purchase/investment power, less profits/jobs, less purchase/investment power, etc). Negative economic growth is just a difficult, but survivable recession, which finds its bottom somewhere, not a complete economic collapse. But if economies don't see the effects and dangers attached to PeakOil, don't transite away from fossil energy and the are already (due to other causes) in dire straits they certainly will collapse completely. No addressing PeakOil as a serious threat to the economy is risking economic collapse, because modern economies are build on cheap oil. Take out the fundament and the building collapse.

COLLAPSING BANKS

Recessions of economies or even collapsing economies can lead to collapsing banks due to massive write downs and also to collapsing bond insurancers: the fundament all banks are depending on. Bond insurancers have become certainly the central facet of the current financial system. Normally this would not happen because banks are historically very conservative in lending money. But the Western World has got the financial system it demanded: consumption growth by increased trade deficits. No questions asked, no one that looks to real values. One big cattle

of sheep. Independent thinking about the headed future was considered as 'not done' of 'negative' and had been eliminated by the management. One large group of beautiful weather sailors. The banks (having a volume drive) and the bond insurancers (issuing their as long the sun keeps shining valid 'guarantees' that surprisingly every bank want to purchase in their volume drive) are not to blame, the governments are not to blame, it was a core/basic problem of the Western World. The Western World needs new leaders with long term vision, both in government and in the financial world. The internet bubble is over (and now just a stable economic development), the housing bubble is over (still collapsing in 2008, we've only seen the top of the iceberg yet). The completely by cheap and abundant credit and cheap abundant oil fueled economy has left us overnight. The party is over (Heinsberg).

Banks their by Basel norms demanded Tier One capital has become just a fiction, just like that was in the First Credit Crisis in the early '80ties. The whole system is build on quicksand of to much credit and to much oil, while real economic values were considered old fashion, they will appear the be the only values left after the dust have left the air. The CDO (Collateralized Debt Obligations) disaster is not yet discovered for a bit: the largest economy of the world has been fueled by it for years, we talking about capital figures in sizes nobody really want to know for the sake of their peace of mind during days and nights. The damage is beyond any expectation and yet slightly discovered yet. The CDO disaster will be followed by the CDS (Credit Default Swap) disaster. As the bubble explodes (stop of credit fueling of the economy plus backfire effects) more and more companies get payment problems and many will go bankrupted, households will loose their jobs and thereby their incomes and will stop paying mortgage payments, interest payments, creditcard debt payments, car loans payments, consumptive credit payments and even taxes. The USA economy is heading for a never seen recession due the 'credit crisis' (better said: due to common sense). By Murphy's Law trouble never walks alone. The credit crisis comes simultaneously with PeakOil, obsolescence, and the end of the Western World's era in the global economic sun. The only capital values that survive the credit crisis are the real capital values (the value of a product seen in multi decade perspective). PeakOil will lead to a total reshape of economies. Reshapes always go sided by bankruptcies. Banks and governments certainly must proclaim PeakOil. Just for their own sake, to minimize damages for their capital (for

banks) and income (for governments) and their future (and the future of their customers as in companies and households/civilians).

COLLAPSING GOVERNMENTS

Governments that are already in economic dire straits due to declining economies, increasing debts, budget deficits, currency problems, trade deficits, negative economic growth direction, less global influence, high stagflation (combination of inflation and economic crimp) rates, ICT problems, less contact with the inhabitants in general, could face very difficult times when they haven't addressed PeakOil and PeakOil really gone hits their economies and deepens the problems severely and also bring new negative effects and dangers to their economies and societies. Governments that have ignored PeakOil will find themselves in such difficulties that only true good or bad hearted political leaders will stay in office, the rest will be cleaning their desks as soon as possible. PeakOil her effect of negative economic growth by higher cost prices and increasing trade deficits will give increasing unemployment, which will lead to increasing societal unrest and even some periods of real intensive societal turbulence. Governments than must cut in their expenses and staffing severely (adjusting expenses to income), because budget deficit lending would not be possible. Building governmental debts and trade deficits in times of tailwind will become the most outspoken failures of the past. Building up an expensive government in times of tailwind will be the curse of the past. Governments that could not control themselves in automatically expending. Taking each year more and more percentages of the GDP, which percentage accelerates in times of negative economic growth, because cutting in government spending is not easy to realize, that takes time and courage or a suddenly disaster. PeakOil will blood drain nations like the Versailles Treaty has blood drained Germany after World War II. When governments gets the effects and dangers of PeakOil on top of their already severe problems and gets problems with payment to their officials, than governments could collapse. It has happen 15-20 years ago in Russia. The Western World has no insurance policy by having the right car. If you drive the right car wrong, you still end nowhere.

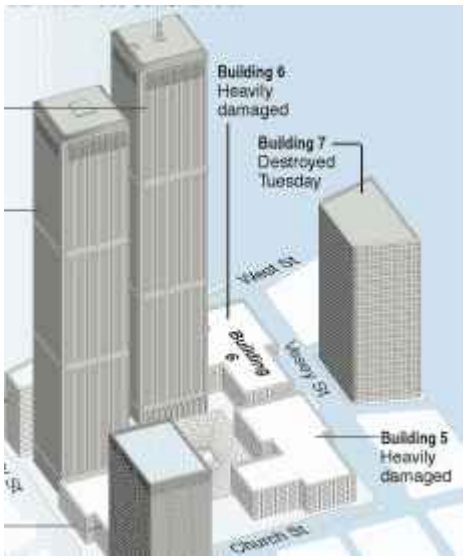
OVERPOWERED GOVERNMENTS

Governments under stress become in the huge temptation of becoming repressive. But even without the being in stress motivation: The Western World is loosing in rapidly speeds it's the USP (unique selling point) that made them prosperous (guarantying an open free society for all their inhabitants). After the 9/11 events safety has contraditionary become more important than freedom.

This development has lead to overpowered governments, that have created (put in place) severe inhabitant controlling infrastructures that go far more further than they were ever in place in the former DDR nation from 1949 till 1989, which need to wall themselves otherwise everybody with (even just only a little) independent brain had left the country. Civil rights have become the orphan children of government and society. These structures maybe harmless in the hands of good/right true hearted leaders, but could be lethal in the hands of not so good (or even bad) leaders. Unaddressed PeakOil will lead to social unrest and even social turbulence as economic systems collapse. Governments that goes further on there safety before freedom way 1) has not the right focus: avoiding PeakOil effects should be the focus and not handling PeakOil effects 2) creates governmental structures that doesn't serve the inhabits and their economies, but that services government as main target (being government is not a target destination, it is a way to serve society, not a target to rule society). These are two developments that both heads for disaster. Government is for/by people for people, there is no other sustainable or acceptable model for the Western World. Governments really need a new focus: energy instead of safety. Governments need really a new model: Decentralization instead of centralization. In economic dire straits governments needs solution creativity instead of just downsize cuts. Governments must refind their true purpose. Ensuring a free, open, creative society that use technology and natural resources to maximize maximum prosperity and wellbeing of both their civilians and companies.

Government is not about fighting terror, that's just a fashion grill, government is about taking responsibility for / servicing the whole spectrum of human (and fauna/

flora) life. Addressing PeakOil is huge challenge, the effects of not addressing PeakOil are severe. Governments must see that they can only serve, that they are not the motor. The motor are the people, the companies. They're the ones that must solve the PeakOil situations, not the governments. The huge challenges of PeakOil don't ask for repression, they ask for freedom. Freedom of mind, freedom of communication, solutions are born in freedom of both. Repressive governments give repressive economies. The collapse of the USSR and Eastern Europe was because governmental repression drained innovation. Fighting PeakOil is about innovation. About finding new solutions, new technologies. Why become Europe (and after that the US) leading in global economy? Because they were the inventors, their societies create and guaranteed freedom of thinking. The laws on Secrecy of Correspondence are not invented by the governments, but a result of the fight for privacy from free spirits up to the Supreme Court. Freedom doesn't come automatically. It must be liberated and that takes effort. Each nation gets the government they deserve. Collecting data and content of phone calls, email traffic, internet surfing, bank payments, credit/debit card payments, public transportation chip card data, road pricing data and search engine queries is not the way a serving government should behave. There are some good books of great thinkers about this subject. Animal Farm of George Orwell is such one. The Prometheus Deception (by Robert Ludlum, 2000) describes a world that after 9/11/2001 more and more is created. A world where also politicians are temporarily needed garbage or just dumb needed puppets on a string in the eyes of the non democratic technocratic driven system and its operators. Politicians should just for their own sake/future resist totalitarian technocratic structures. ICT is a blessing for the world, also governmental ICT, but wrong focused governmental ICT is like PeakOil also the end of the world as we know. Solving PeakOil needs freedom of mind, of thinking of structures. Economies must leave oil before oil leave them, the first is economic a little painful, the last results in full economic collapse. Not freedom of dictatorship. Maybe the Western World enjoys a repressing state more than a free state. But repressing will not give the by PeakOil needed technologies and solutions. Governments have had the last decades a criticism break due to consumerism. Both civilians and press has had last decades other priorities than freedom. Consumerism has taken them both hostage. Governments has had no tricky questions or demands for consequences when cam to public knowledge that they intentionally had lied about the existence and capability of WMD (Weapons of Mass Destruction) concerning the invasion in Iraq.



Governments has had no tricky questions when they lied about the cause of collapse of the Building 7 of the WTC complex, in the evening of 9/11 on 17.20, 6.52 hours after the collapse of WTC1 North Tower on 10.28 and 7.21 hours after the collapse of WTC2 South Tower on 09.59 collapsed: A wide and tall 47 story high steel frame skyscraper, with 58 perimeter columns and 25 core columns, that according to governmental statements has collapsed due some small fires in 6,5 seconds (free fall of something thrown from the roof would be 5.96 seconds) although its core when down first and it leave an imploded type pill of ruble behind. The WTC7 was outside the basic square foot print of the WTC complex and farther from the Twin Towers than the Banker's Trust building, but has the same owner as the other WTC buildings. Never ever in the history of steel frame skyscrapers a skyscraper is collapsed due to fire. Substantial bigger fires that longer burning and were more inters has never collapsed a steel frame building just because steel frame building (due the fact that fire temperature can't weaken steel). The footage can be found on http://www.911research.com/wtc/evidence/videos/docs/wtc7_collapse2.mpg. Other skyscraper fires never had collapsing effects: The fire in One Meridian Plaza in 1991 in Philadelphia raged for 18 hours and gutted 8 of the 38 floors completely, but the building still stands after those 18 hours. From each plane that crashes the debris is collected piece by piece by the NTSB, important parts are re-attached as much as possible to understand the cause of crash and prevent new crashed by adjusted FAA regulation due to the cause of the crash. Quoting wtc7.net: "That is why the NTSB carefully documents aircraft crash scenes, and preserves the aircraft remains, frequently creating partial reconstructions in hangars. If an investigation reveals a mechanical or design fault, the FAA usually mandates specific modifications of equipment or maintenance procedures system-wide, and future aircraft are designed to avoid the fault." In the world there are much, much more high buildings than there are planes, investigation of the collapse of WTC7 was crucial for global tall building architecture: the rubble pile was at least as important as any archeological dig. Yet the remains or WTC7 (that has collapsed without being hit by a plane), have been transported as soon as possible to the harbor and exported steel scrape. The total research budget for the 9/11 WTC collapse in total was $ 600.000 and was conducted by the FEMA (Federal

Emergency Management Agency): an organization with not any research track record what, specialized in down sizing turbulence as being an emergency management agency of the federal US government. Leaving each architectural company around the world with the big question: what was wrong or who lies, our steel calculations or the government, and: are all the steel tall buildings around globe that already exist and that are build right know safe? But the critic holiday for governments will come severely to an end if PeakOil hits our economies. The former/ex consumers, cut out of their consumption dream will be more critical as never before, searching for who to blame for the ending of their dream. If troubles happen, somebody has to get the blame and that certainly will be the government. If it will become officially know that the US Governments does have told the truth about 9/11, this can be lead to a collapse of US federal government. Not telling the truth about Iraq is something different than not telling the truth about 9/11. Governments that want that their economies (companies and civilians) and own existence as political leaders will not be severely hit by PeakOil and the bitterness that will come by that must immediately change their priorities, agenda and behavior. Being open about PeakOil, stimulate solution inventions, guarantee freedom and honor criticism as their guidance for staying on the right track. Reform themselves to be capable to perform in difficult times, not by dictatorial practice, but by ensuring freedom not only with words, but with their behavior. Human rights and civil freedom are damaged severely by Patriot Act legislation.

The founding fathers (where there better patriots?) would have let the underwriters of the Patriot Act arrested for contempt and revocation of the Constitution. This is not an overdrawn statement. Under the Patriot Act even societal and economic essential crucial issues (like news gathering) could be seen as supporting act of terror. As to decide on time and place by the government. The war on Terror has lead us un-intentionally to a War on Freedom and Democracy, this could never be the target of fighting for freedom (as all American the government certainly should support in). The Patriot Act completely undermines the open free society, which terrorist just wants to attack. We must not do that for them. Incidental terror (although the size and impact was gigantically) is no reason to leave the Constitution that has build what terrors just would attack. The legal status of everyone and everything has become more virtual than ever. The Patriot Act was signed as early as October 26, 2001 by the President. Just 45 days after 9/11, a unique remarkable never seen before timeline for designing, writing and passing a bill, making it the most hastily bill ever. Critic on this haste in passing this huge impact legislation was considered unpatriotic. Written in haste and passed to law by

fear. An empty stomach is not a good political adviser has Einstein said, even so is a terror act not a good legislation advisor. Overpowered, repressive governments will deepen the effects of PeakOil (and not create an economy that avoids them) and thereby risking the exposure of the dangers of PeakOil and Climate Change to their nations. But things are changing in the US. Hollywood has made the feature movie Rendition (www.renditionmovie.com). Each theater in the US runs this movie about the disappearance of civil right and to much governmental overpowering. Freedom is something that lives in the deepest emotion of Americans. When safety becomes less freedom, Americans will choose freedom. The roots of the USA are 100% freedom. The roots of the Founding Fathers we're in the not much freedom celebrating parts of Europe in that days, that's why they went to America. America is based on the emotion of freedom. Therefore overpowered governmental structures will have no long life in America.

DICTATORIAL GOVERNMENTS

On of the things overpowered governments could do by the Patriot Act and the Home Security Act is the installation of Martial Law as they think this is needed. The implementation of non democratic Martial Law will become a real danger in economies and societies that hasn't address PeakOil related issues and therefore will be hit severely by it effects. Taking the whole Constitution and Bill of Rights (short temporarily or long till governmental collapse) out of order, by replacing it by an unknown absolute/mono power of the government/military, which will end all civil rights. Martial Law is different from the State of Emergency, which is applicable by heavy nature disasters (New Orleans from Katrina till today) and social unrest like the riots (Los Angeles). Some information on Martial Law on the Internet can be found for research: Wikipedia: http://en.wikipedia.org/wiki/Martial_law. Footage of a FEMA concentration camp on http://www.youtube.com/watch?v=0P-hvPJPTi4. Footage of some questions and answers about Rex84 at the Iran Contra hearings on the spending purposes of the on weapons trade earned money in 1987 on http://www.youtube.com/watch?v=Ug0IL7k3elQ. Wikipedia describes Rex84 more extended on http://en.wikipedia.org/wiki/Rex_84.

Governments must address PeakOil, not preparing for the worst, but avoiding the worst. If they do so, the effects of PeakOil will not (or very light) effect their economy. PeakOil is a challenge for governments. A challenge even in size than

winning World War II. Winning World War II has been accomplished. Addressing PeakOil also can be accomplished. And yes it will lead to less importance of federal government structures.

REGIONAL IRRITATIONS

There are many causes for regional political bad weather and continue tensions. Floods, droughts, continue clean sweet water supply by rivers, foods, natural disasters, political changes, etc. Bad weather is more a parable than literally mentioned. Israel her relations with many her neighbor nations, and special with the Palestine Authorities, is a classic example of regional bad weather.

REGIONAL TENSIONS

But maybe regional water deficit is the most severe potential regional political tension maker. Water is not some political disagreement, but a daily need for living, to survive, to wash and feel fresh and for growing crop. What if Turkey decides to dam the rivers that origin in her territory for energy generation purpose and/or for industrial, domestic and agricultural use, with the motivation that they have decide to stop free water exports. Syria and Iraq would than be severely damaged by such a decision and certainly must suddenly pay an annual price for just an already ten of thousand years existing river water delivery to Turkey. Not on this map: some of the rivers of Georgia, Armenia, Azerbaijan and Iran also spring in Turkey. Turkey is just the water supplier of a huge part of the Middle East and some of Central Asia. And this is just one example: there are above 100 identical potential tension creating situations known globally. This huge impact decisions are not may in times of cheap energy or water surplus, but if they certainly can be made in times of energy and water shortage if the mutual relation is already somewhat disturbed. PeakOil and Climate Change certainly can cause huge regional tensions. Tibet is literally the water tower of Asia. All of the ten major watersheds originated in the mountains of the Tibetan High Plateau, and these ten rivers spread water throughout Asia. The combination of these ten in Tibetan mountains originated rivers serve 50% percent of the world's population. Although this huge volume of water is created mostly in Tibet, only 1 percent of this water is used by Tibetans. China wants to channel water from other rivers to the Yellow River, because the Yellow River has a water deficit, leaving less water to flow trough the tabbed rivers.

Other examples are oil/gas fields: they sometimes cross national borders. In times of PeakOil neighbor nations could have severe arguments about what is from whom and about production limits. Certainly since drilling something is that no longer can be done vertically, but also diagonally of horizontally. Surinam versus Guyana. The oil field on their mutual border has been granted by Guyana by the International Court, but this decision has been 'oil on the fire' for the opposition parties of the current Surinam Administration. An other regional tension in Pakistan / India. Also Venezuela / Colombia is a regional tension. National leaders that feed pure political regional tensions damage the interest of their nation. This applies also to Venezuela and Colombia. And Venezuela has a huge trade deficit to Colombia, something that makes the situation once more complicated.

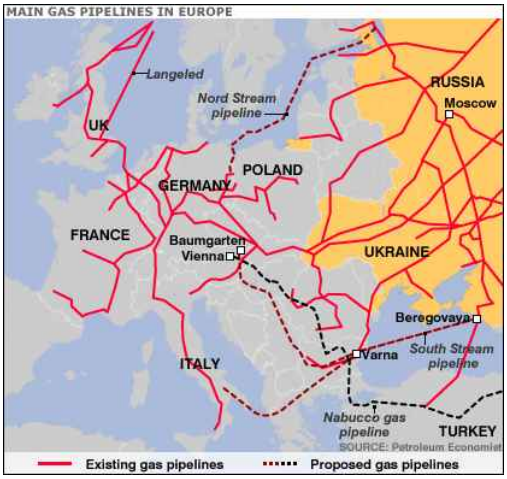
REGIONAL BLOCKS

When regional tensions not be down leveled by diplomacy, but stays unsolved on high levels and each new development press the tension to higher levels, problems will occur. Tensions have mostly reasons that influence more nations. Tensioned nations seek support of other nations. Regional Blocks are formed than. When a Regional Block is of a kind of many nations to one nation the block mostly solve the problem and the tension will be down played. But when there are two Regional Block are formed (multiple regional nations to multiple nations) the consequences could be explosive, because than there is no central conflict management. The future is for real good diplomats. They can prevent huge human, economic and governmental damage. The future is also for technocrats who can solve shortages by technology. Shortages and problems with ethnical groups are the real reasons behind future wars. Shortages can be solved by technology. Not solving shortages is ordering war. Delivery time not known yet. Diplomats and technocrats. They solve the causes of war. Passive reactions on growing shortages leads to sudden severe shortages with all the regional war problems attached to that.

REGIONAL SPARKS

The decision of the Israeli Government not to fuel the power plants of the Gaza Strip. One young not wise politician who make a not very clever statement. The cut off of deliveries to the Ukraine by Gazprom due by Gazprom claimed high payment

backlogs on deliveries. Ukraine doesn't deny that statement and reverse it (back to USSR times). But 80% of the Gazprom deliveries are transited though Ukraine and Gazprom is becoming more and more the natural gas supplier of Europe. Last time there was a payment conflict between Ukraine and Gazprom, and Ukraine was cut of supply, Ukraine just connect their natural gas infrastructure to the transit pipelines of natural gas to Western Europe. Ukraine has promised no to do so in the future.



This 'transit nations are also customer nations' issue is the reason that Gazprom has decided to build a new pipeline through the East Sea, which will come onshore in Holland, bypassing the East European countries. Russia is certainly not forgotten that they have been spitted in the face by their former compulsory 'alliances'. Russia and East Europe must develop new relations that bring a stable and wealthy Europe and a stable and wealthy Russia. East European states must or pay Gazprom or go into energy transition, or (more realistic) do both. Biting the hand that energizes your country is not a wise thing to do. Russia will accept bull talk of former USSR member states, Russia and Gazprom will not accept both payment delays and bull talk. While Europe is talking about building natural gas lines while they're gas deficit, Russia and Iran just divide the further market between them to, forming a natural gas cartel. Gazprom even will realize the gas pipe from Africa to Europe. Russian politics is action politics. European politics is talking politics. The secondary (out of Russian influence) Nabucco gas pipe line to Europe will never be realized (and if it will, there will no gas to transport for the line): Russia don't talk to much, Russia just has gas and writes contracts with needed transit nations in exchange of supply. And if it would be realized it will be a gas less pipeline. Belarus and Russia are in a conflict over the gas price. By the law of market polarity change, it's almost certain that Russia will win this argument. The by supply/demand formed world prices will become the leading prices in all transactions. Buyers enough, why sell to someone who want pay less or pay late? Natural gas deliveries will feed a lot of the regional tensions and cutting of natural gas supply could be huge sparks. Russia just can say to Europe if their conflict with Ukraine will not be solved and Ukraine again connects their gas infrastructure to the transit pipes to Europe: "We measure volumes by our border departure, that volume must be paid, Europe, fix the Ukraine problem." Just like natural gas, also

water will be due to damming, extreme irrigation, pollution are huge sources of sparks (suddenly draughts, suddenly pollutions). Fortunately sparks needs high tensions to lead to explosions (as in: war) otherwise they're just lame light flashes.

REGIONAL WARS

Both regional and geopolitical tensions could end in war. Tensions are like fire in the house. Certainly not all tensions lead to war, but war is certainly a result of tensions combined with events. Tensions is the gun powder, events can be the sparks that cause the explosion. War is just an unhappy result or bad lack combination of the combination of tensions and events.

REGIONAL DÉTENTE

This is the reason why preventing tensions is so important, sparks can never be prevented, but tension is addressable and controllable. Wise leaders don't spill there people and their nations to militarism.

If there is no gun powder (tensions), sparks (events) are mostly completely harmless. Preventing tensions, by creating a world that's has less severe conflicts of interest is important. There are several well functioning examples in global history.

GEOPOLITICAL IRRITATIONS

When a government goes bankrupted by not being able to finance their budget deficits, that bankruptcy severely ruins foreign economies who has heavily invested in the bankrupted governmental bonds. These are (by the reason the trade deficit and the budget deficit has grown) the mostly close related nations. The assets loosing nations will be very disappointed. Thereby such situations will damage deeply the geopolitical relations and generate geopolitical irritations / bad weather. When a government invades strategic located or energy/resources rich nations (like Afghanistan, Iraq or Venezuela), this also cause certainly geopolitical bad weather. Russia her blocking of an European Gas line to Northern Middle East by signing exclusive contracts with transition countries was certainly an irritation, although it maybe is more caused by the EU talk much, act less culture than by Russian polity. Leaders cause irritation by followers. Always. Bush and Chavez are leaders. They cause by nature irritations.

GEOPOLITICAL TENSIONS

There are so many causes of geopolitical tension possible in times of PeakOil and Climate Change. But even today there are several severe geopolitical tensions build up. Tensions build up or disappear as time pass by. Even today there are more examples than wishful thinking wishes. The Independence Declaration of the Kosovo province from Serbia in February 2008 is a good example of a tension increasing situation. Also first the USSR and later on the USA invasion of Afghanistan. The USA had supported the resistance against the USSR troops during the 1978 till 1989. But in 2001, (surprisingly) only 2 months after 9/11, the USA organized a multilateral invasion in this very rich in elements country, which also heavily was needed as pipe trespassing carrier for a natural gas pipe line for Unicoal from Central Asia to the high seas for making export possible. The negotiations with the Taliban concerning the pipeline and its protection where reaching a deadlock in the summer of 2001. There are rumors that the current Afghan President is Hamid Karzai was one of the Unicoal negotiators in the pipeline talks with the Taliban. This statement made by Le Monde is not confirmed by other sources. But it's a fact that Unicoal needed trespassing in Afghanistan or Iran to reach the high seas and that their negotiations with the Taliban reached a deadened in the summer of 2001. Karzai certainly was a CIA supported freedom fighter and CIA liaison officer during the 11 years of USSR domination of Afghanistan. In 2003 the Afghanistan invasion was followed by the (again multilateral again) invasion to Iraq by the Western Allies lead by the US. Possible motivations (quoting Alan Greenspan): switching oil payments away from dollars to euros and rich oil reserves, and not the for PR reasons mentioned WMD (Weapons of Mass Destruction) because US intelligence reports had already multiple stated that Iraq didn't have such weapons and was also not capable anymore in producing them. Hussein is removed, the nation is in chaos.

The war is started with no post war plan. The US administration in '40ties and '50ties have down in Europe a severe better job after World War II, one (honestly earned) reason why European Governments always has been very supportive to the US. The North Pole and the South Pole and their natural resources are certainly a huge geopolitical tension danger. The first claiming moves are done by some nations and have disturbed other nations. Certainly now the North Pole from 2013 on seems to become completely an open ice free sea for several months a years, and the (severe more expensive, but by high oil prices certainly becoming

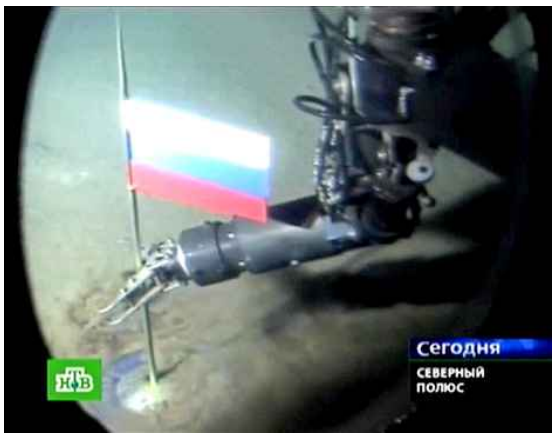
economic) both deep sea and cold water drilling and underwater flexible piping techniques are improving more and more.

GEOPOLITICAL BLOCKS

The Warsaw Pact ended after the collapse of the old USSR in 1991. The NATO is becoming more and more divided by two policy directions (the wolfs and the doves, military versus diplomacy). Member states taken passively more and more distance from the USA offensive strategies: each year there are more difficulties in finding new troops for extra NATO soil actions, which makes NATO's offensive strategy more and more only US based. Single nation invading actions, are not considered legitimate in geopolitical terms. The NATO has it birth ground and reason of existence in multilateral fear for communism. But communism as economic (and therefore political) model has passed away. NATO also will pass away, just like the Warsaw Pact. New geopolitical blocks will be formed and their influence will grow. The old geopolitical world order with mostly by the Western World dominated international organizations will disappear. Old structures (IMF, WorldBank, etc.) will not reform (changes takes to much friction and energy), new structures will just puss the old structures out of the market. The US and Russia will loose their veto rights in the UN, due to this new world balances. The OPEC has it second life period and is getting both more and more important (as a collection of important suppliers and joint voice), as more and more not important (as organization, while just supply and demand dictates completely the market mechanism). But OPEC members more and more get the picture that (also fake) tensions increase their income more and more. The OPEC will gain in importance as negotiating organization between members concerning tensions and conflicts of interest (and that conflict of interest is certainly not any longer the market: supply has gained her dominance for ever). Not one OPEC member is against high oil prices any more, not even the rational nation of Saudi Arabia. There is only one catholic/western member of the OPEC and this nation don't get each days flowers of western states, but is punished with isolation.

The Western World really don't realize the huge problems which her energy deficit will cause them the next years. There will be an Islamic Geopolitical Organization. But there is a lot of internal competitor ship between leadership, the Islamic World must learn that geopolitical organizations not is about who is boss, but about enforcing common interests. There certainly will be a South American Organization. The Venezuelan Administration and their diplomats are working by diplomatic regular

traffic and targeted contacts very intense on the creation of such an organization. They are backed fully by Mr. Chavez his personal drive for increased South American self awareness. The US certainly will pay their fines for their political behavior in Central and South America in the last 100 years. Stay stocked in bully attitudes in South American bilaterals is the last thing the US needs right now in times of PeakOil. Asia will have its own Pan Asian Organization. Europe becomes more and more an European Union. Russia with its new leader President Dmitry Medvedev will face a new self aware and more open and bilateral focused. Mr. Medvedev has a legal education and experience and was both the legal advisor of the former President of Russia Vladimir Putin, as the second highest Gazprom chairman. Energy will be the glue between Europe and Russia. PeakOil will both speeds up the creation of these blocks (as they are needed for realization and ensuring the new HVDC power infrastructures) and make them lean and mean. In times of PeakOil federally structures just get some limited federal tasks and will just perform these tasks. PeakOil certainly will speed up the process of International Armies. When governmental budgets are hit by negative economic growth (less income, more costs), the national armies will considered to become to expensive and completely out dated concepts in times where wars are fight pure economicly. Armies also are expensive branches of government in economic not very easy times. A small EU Army will be formed with the size of just one nation army. The weapon industry will certainly come in dire straits and will (under stock-holders' pressure) change completely to both energy technology and glass technology. Russia, Quatar and Iran have together 56% of the world's natural gas reserves. If they make an alliance with Algeria (and they will), they become very powerful. Gazprom has by a deal with the Italian energy giant Eni already the Libya natural gas reserves and also the African-Europe natural gas pipe already covered. End April 2008 they've put Eni to the front for buying the current European transnational natural gas infrastructure. Who has the resources is the dominator, it's a simple as that. The USA has had that time in the prosperity sun. Now it's Russia's time in the prosperity sun. A natural gas 'OPEC' type of multilateral cooperation will certainly be realized in the coming year. When Russia, Qatar, Algeria and Iran decide to lift the natural gas prices above market supply/demand based prices (with the motivation that natural gas is a finite resource and that it is in the interest of the world economy (conversation of a finite resource) and climate change to limited the supply to the world, the world should have to except that.



New blocks will be formed, even just to close bad payment habits out of their deliveries. To have is to rule, to need is to serve. The new reality, that's even not new. Global politics is based on this truth since the beginning of geopolitics. Most of the new blocks will not be based on politics or ideology, but there will be wheat blocks, corn blocks, nickel blocks, blocks of the suppliers of any commodity where demand outstrips supply severely. Commodities are the new politics and the new ideology. Certainly the god of capital will replace the god of religion as much in Islamic Nations as it has done in the Western World. Wealth and religion are opposite powers. One of the reasons the Western World could have a religious reveal when prosperity is by energy purchases transferred to other nations.

GEOPOLITICAL SPARKS

When the going gets tough, the tough gets going. The more tensions, the chance for events. Events that could function as the sparks that turns tensions into wars. The sparks that eliminate rationality and triggers emotional impulse reactions. Small things become big things in already stressed bilateral relations. Examples? World War I started with an assault on just one governmental representative in just one country. There are more possible sparks to describe than there is space for in this situation analysis. And even some not very well thinking politician could spark a lot in geopolitics. Natural gas delivery cut off's could be a huge spark. Or a new nuclear accident. Or an actual bankruptcy of a central government or currency. Or just some more talking than thinking politician.

GEOPOLITICAL WAR

As in: total war. The changes in the current global status are very low, but if (only some) of the dangers mentioned above become reality we have a different world. The good news is that war needs fuel and capital. And both are getting more scarce in some parts of the world. Climate Change without PeakOil had certainly resulted in wars. But PeakOil although it's a shadow above our current lifestyles, can be turned into a more peaceful world. In the good old day geopolitical blocks gets war if the member state of one block invades a member state of an other block.

GEOPOLITICAL DÉTENTE

By the lessons learned of the torments of World War II, there is certainly the need for a new type of Global War Prevention agreement. Not just an other organization, but just a new Geneva II Agreement. A multilateral agreement concerning resources, that more and more countries could under sign as the like. Just a conference (not related to any current global organization (something like the Global Peace Organization) where countries promise by signature (without any sanction other than diplomatic remembrance) that they will not solve any shortage by war. Maybe the International Court in The Hague Holland can play a role in this.

Maybe the new KiloJoule trade currency (better said: no currency, but just a money creation liberated value) just designed for international trade, not based on gold but on joule, not linked to a country, not even being a real currency, but just a value anchor, will play a role in this. The times of money creation are over, the times or energy has come. In an enhanced more localized world, real values are all that matters. The Enron case has learn us that energy deals in balance sheets can be made as virtual as air, so banking in KiloJoule Value should be forbidden than, just for keeping the value clean of any speculation or financing not connected to real production capacities.

INTRODUCTION

Can the global economy facilitate an increasing world population with their overall increasing prosperity demands in times of PeakOil by its combination of more demand, less supply and more expensive exploration caused limited resources (energy and elements)? Can the global economy avoid climate change with its effects like water shortage and oversupply and right (not to strong colder or strong warmer) temperatures? How should we react? What are the best basic policies for this reaction? What are the doors to the solutions? They answer is as simple as 5 R's: Research, React, Reduce, Realize and Relax.

RESEARCH

Intensive and just relax research for more information is the first adequate response. Libraries don't have much information on these actual developments. But certainly on Energy Crisis I and Credit Crisis I. Most analysts only make photos of the past.

Google searches and YouTube feeds contains a lot of actual data, information, visions, solutions, in high quality, low quality and of course a lot of garbage. But some evenings spend on Google and YouTube will certainly give a lot of information, some knowledge and several solutions.

REACT

Communicate your research, you get interaction of other researchers and this will deepen and widen your knowledge. Proclaim the conclusions of your research to wider audience. Not you must move, the economy must move (and you as part of it will move with it). This problem will not be solved by a 'change the world, start by yourself' approach, this problem is too urgent and the effects only can be prevented by a huge economic model adjustment, otherwise also you'll find yourself also in dire straits. There is no individual island focused approach on PeakOil possible. We'll survive together of we're going down together. Research will automatically lead to publication and publication will automatically lead to awareness concerning PeakOil, its effects and the possible solutions. If the reality

of PeakOil and its effects has become clear to you, it will also become clear to others as you communicate. PeakOil addressing solutions must be widely supported by both governments and corporations. If there is no reaction on PeakOil, PeakOil will hit with all its effects without any softening that reaction cold have given. Damage impact can be lowered. A wide offensive of governments, companies, organizations, households and individuals could make not a, but the difference. The consequence of not reacting are severe: high stagflation rates (inflation by negative economic growth), high unemployment percentages (which deepens the economic problems even more) and high negative economic growth percentages: a vicious downwards spiral till a new by the situation adjusting bottom is found and accompanied with economic collapse, societal chaos and geopolitical tensions. The reward for reacting is also severe: maximal maintenance of wide prosperity, no collapse, no chaos, no war and even increased well-being (as several negative facets -like traffic congestion, water pollution, or bad air quality- of the cheap carbon based economy disappears).

REDUCE

It logical that cheap oil has lead to economies that uses a lot of it. It's logical that expensive oil will lead to economies that use less of it. Energy use must be cut, not some lousy percentages, but lets say by half (50%) as a starter. This is not a wild idea, but just an economic reality in times of by PeakOil caused high energy prices. Reducing is about 1) conservation (minority) and 2) changing processes (majority). Conservation only certainly will not give this kind of reduction. Conservation is also not a target that needs to be promoted anymore. Energy prices certainly have taken over the lead in that. No further attention needed for the conservation issues. When energy becomes high priced, for economic reasons all processes, devices, models that use energy will be redesigned. The market does this. Just because it's economic. High energy prices are a huge steering force to a more sustainable world. Conservation is doing the same, but with less energy. Improved performance of devices. Changing processes is what we really needed, and not sometime in the future but in the next years.

Changing processes is about doing things differently and cutting that way the energy use tremendously. It's not about doing less, it's about doing things differently, getting the same performance by substantial less energy use. Changing processes gives economies, companies, households and individuals really giganti-

cally energy use reductions. Changing processes makes really a 50% energy use reduction possible. Changing processes is about changing and about processes. Governments, companies, organizations, households and individuals don't like changes. Changes are considered risky, changes are about reshuffling, reshuffling is about new models and also new positions. Changes are about the risk of losing the existing benefits. This make changes in time of PeakOil a little more easily, because don't changing will certainly leads to losing benefits. Changing processes is about preventing damage, that certainly will occur if processes stay the same in energy consuming levels while energy prices skyrocking and energy shortages and supply interrupts will occur. Changing processes, what does that mean? It means that we look to everything that use energy and that we ask ourselves: how can the same productivity be done with less energy. When governments, companies, organizations, households and individuals start asking them selves this question the changing of processes is already started yet. Reducing severely the energy consumption by changing processes contributes significant in preventing negative economic growth caused by rising energy prices. Negative economic growth by rising element, material and food prices will still be effective. Changing processes give the possibility to maintain prosperity levels as much as possible. Changing processes also reduces trade deficits (which more and more are caused by energy purchases). Changing processes demands new processes. Ask your universities for them in exchange of no budget cuts in dire straits times if they do so. Reducing is not about less consumption. The higher energy prices will have that effect. Reducing is about maintaining as much as consumption in headwind times of very Expensive Energy.

REALIZE

As carbon energy supply declines, carbon energy demands grows, carbon energy exploration become more difficult, and carbon energy prices rise (not only oil, but also gas and certainly coal, coal even more than oil) by these three influences to never seen levels, ending the time of Cheap Oil/Energy and creating the time of Expensive Oil/Energy. Than it's certainly time for each nation to create/realize new energy generation. 1) realize all nations' natural carbon energy resources (oil, gas, coal and also tarsand) based possible capacities, diversify as much as possible (also in carbon energy imports of your own carbon energy deficit, both in type and supplying nations),

2) realize all nationals renewable energy resources (huge central wind, huge central solar CSP, massive decentral wind, massive decentral solar, massive decentral thermal) based possible capacity, diversify as much as possible in types and locations (also in renewable energy imports of your own renewable energy deficits, both in type and supplying nations), if prices are equal, prefer (from climate, local environment and sustainable perspectives) always the renewable option 3) realize good bilateral relations with the supplying countries, if you still needs to import carbon or renewable energy (as in asking: what can we do for you?), that insures supply when the granting distribution model come on top of the demand/supply model (as energy prices reaching their maximum levels), that cure the trade deficits that are caused by energy imports. Those three are very important. Don't wait for better times to come, the better times just must be made, realize those three. Making better times (and preventing dire straits) is as easy as realizing new energy producing capacity (or imports, if there is still an energy deficit). Diversify your supply/resources, the more diversified they are, the more secure is the supply and thereby the economy. Diversify your carbon energy types and suppliers, the more secure is the supply and thereby the economy.

RELAX

PeakOil is certainly a threat to the economic growth of the Western World. Economic growth in the western world we become something of the past. Maintaining prosperity in the Western World is the highest achievement possible. This is not some doom scenario, but just reality. Growth models for the Western World are not realistic fairytales, told by people with no analyzing capacities and blinded by their faith in growth, totally overlook the headwinds the Western World face in the 21st century. The differences in characteristics and outlook for both the Western World and the Emerging World are more specific analyzed and described in the Addendum of this Analysis. PeakOil is certainly a threat to the economic growth of the Emerging World. But they will grow. The energy surplus nations in the Emerging World will grow double digits a year (there are no energy deficits that slow them down). The energy deficit nations in the Emerging World also will grow, not double digit, but the will grow each year (their economies are still relatively low energy demanding). The reason is that their prosperity levels are low and therefore can rise (by severe less resistance) much more easily than the Western World.

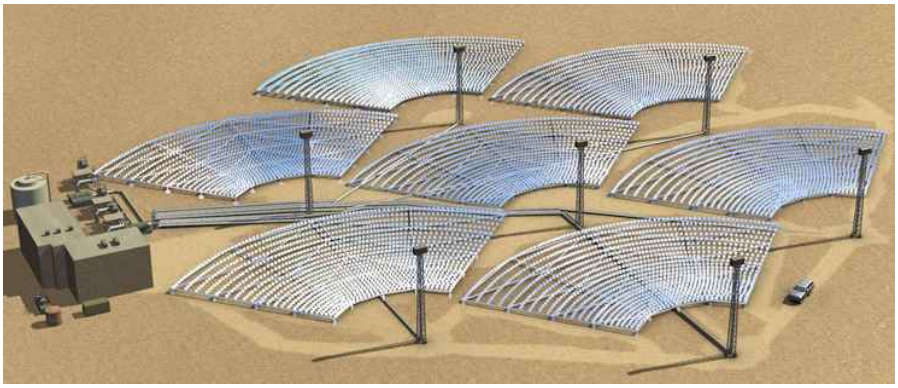
If PeakOil is addressed wisely, PeakOil will not be a disaster. PeakOil can by action, technology, business model changes, production process changes and capital be turned into a blessing. PeakOil certainly will lead to less consumption in the Western World. But PeakOil (when it is addressed wisely) can increase well-being levels in both the Western World and the Emerging World. Unaddressed PeakOil will lead the world into Armageddon, but when it's addressed it can give a good world to live in for the current 6.7 billion and the 2 billion that will join us later on by world population growth. So just research, react, reduce, realize and than: relax.

INTRODUCTION

Elements are the real issue, because they're really finite and can't be replaced by other sources, as can in case of energy. Energy certainly can be generated renewable. Can. We don't do it know. But we will be. When? If the price of fossil energy makes that renewable energy is cheaper than fossil energy. When will that happen? It is happened end of 2007. So yesterday. As said in the Management Summary: The size of the world population we can not steer, the prosperity demand of the world population we can not steer, the size of the natural resources we can not steer. The facets we can steer are technology, organization and capital. And as world community we are good in all these three. Very good. We need renewable energy capacity, both remote and domestic. We need financial structures to finance these investments. And we need to change business models and production processes: they're designed in times off cheap energy and need an energy factor revision.

TECHNOLOGY

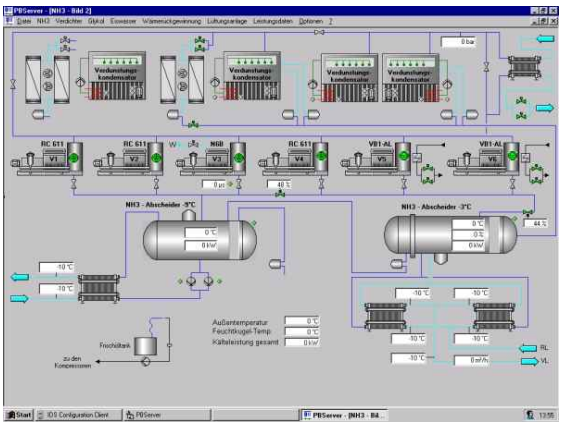
Technology is the middle name of civilization. We like technology, it has brought us prosperity. Due to cheap oil we had chosen a wrong technological direction in the past. Accelerating increasing oil prices, accelerating decreasing non carbon energy prices and difference in future perspective of both make it easy to use technology again to give us a new era of prosperity. Renewable energy has become cheaper than fossil energy. We need sometime to realize this (for the moment we yet think high fossil energy prices are temporally). But when will become clear that they never goes down, there will be an investment wave for renewable energy. Renewable energy has also its limits. Both initial and in exploration. Initial: Technology, capital, production capacity and space. In exploration: capacity. Energy for the prices we're used to is something of the past. We're in of this denial at the moment, but end 2008 everybody will know that. The problem is that our whole economic model is based on cheap energy; our complete install base is based on fossil energy.



We need to generate renewable power at huge volumes, these are major capital investments. The team that has made this analysis have also designed the to this analysis attached Finance Model for energy investments. We need new wind power plants on sea. We need new solar power plants in the desert. We need new HVDC intercontinental infrastructures to get wind power and solar power on our national grid. We need to change our install base (for example: all our cars and trucks) from fossil to electrical (our install base is such a problem, that lead to so much lost of suddenly becoming historical economic capital, certainly in a time when energy and elements are in a price run to never seen levels). We need to install decentral renewable energy harvesters on each house (solar power roofs and small round model quiet windmill). We must invest mega, just to being able to be able to do the things we do now these days for granted based on cheap fossil energy). And last be certainly not least: we need to design a less energy consuming economy and society, but the market (energy prices) will lead us there automatically. PeakOil will redesign our economies (let's make it better) and thereby our personal lives.

CHANGES

We must change both business models and production processes. Just because the are both designed in cheap energy times and thereby has become outdated in times of expensive energy. All companies must create a helicopter view on their activities: Just set their performance targets and then ask themselves "what the way to reach these targets with the less possible energy use". This demands an overlooking view from a distance/height, a the total company's existence overlooking helicopter view. CEO's should be good in this, but they are and will be mostly buried under the demands of every day's operating business. This demands also a totally fresh view on the whole business process from the first action to the last action. This will become an area for external specialists. Process consultants: freelance independent or institutionalized in new consultancy firms. This also become an area for specialized process developing companies and universities, who license their (partial) processes to manufacturers. Changing production processes to low energy demanding models will also will become the main subject in the sector specific business media. Reducing the energy demand of the business processes will become the main market weapon in terms of cost price controlling and the main financial weapon in creating corporate profits.



The general office production will be reorganized within a year after starting the transition process. There are two reasons for this. First: it can be done with standard available software models, there are less customized solutions needed. The integrated E-Dir/NAL/WindowsServer/RemoteDesktop/NovellClient combination makes it possible to do any office work anywhere. Including working phone extension and videocalling. Commuting to offices will be cut with 80% within 5 years from now. This will lead to better office productivity as people will save 2 x times a day a commuting hour. Management will have even better control and steering because new designed processes will be designed based on production and performance. The office desktop will replaced by a virtual desktop. This also will bring unknown qualities out of own employees. This process can be started by a message of the CEO. "As energy costs rises and climate change is a threat, we must do things differently, switch to a low energy demanding model. We have installed a corporate process architect, email him/her your contributions. There is also a forum/bulletin board (knowledge interaction) and a wiki (knowledge tree) installed. Both can be found at the following intranet address. Your personal login for both is connected with your personal network login."

CAPITAL

Technology and changes demands capital. But no technology and no changes will result in to high costs due to energy and therefore in losing both market share and corporate profitability. PeakOil will certainly lead to a company fail-out. Companies who can not finance their transition, or companies who started transition to late, or companies which no good transition management (too soft -no timely decisions-, or too hard -to quick bad decisions-) will be bankrupted due to losing both market share and profitability, both caused by too high cost costs than their on time and the right way transited competitors. PeakOil is also an opportunity for companies, to being better that the competitors, both national and international. The US business world as relatively the heaviest oil users, so the owners of the most expensive production processes and office/sales models, will certainly hit by the more to energy actuality adjusted industry of Europe. This will waste the benefit of the cheap dollar on the world market for US companies. US companies will condemn the former governments that don't underwrite Kyoto. The European industry is by Kyoto targets already focused on low carbon energy using production processes. The environmental based carbon reduction now pays off in lower energy costs and therefore in lower market shares and disappearance of corporate profits.

The more ironically part of the funding/capital facet of the transition investments for both the Western World and the Emerging World, is that they must borrow the capital back from the nations (or from banks owned by these nations) they have first transferred their capital to by purchasing their oil/gas/coal. Late reactions have their price.

REMOTE CAPACITY

Cities and industries have been and will be energy deficit by nature. There are huge new energy supplying facilities needed that can power the cities and industries. These energy generating facilities could not be located in or nearby the cities or industries, otherwise they wouldn't be energy deficit. Small local industrial volumes can be powered with local power surplus (PV and Wind power generation of households that deliver their daytime surplus to the local grid). But cities, with their concentration of house, shops, stores, offices, factories and warehouses will always need remote energy capacities. Remote energy capacities always will deliver more expense and less secure energy supply. Energy, water and food will be in cities much more expensive than in suburbans. Smart cities and nations chose for diversification. Both in supplying countries and supplying technologies/sources. By the fact cities are the ones with the energy deficit (the ones that cause the national energy deficit), energy policies will be more a city (or joint cities) issue, than a national issue. Cities will want to draw their own lines in terms of solving their energy deficits. How to create this remote capacity? In 2008 there are two valid renewable options. Remote CSP (Concentrated Solar Power) in deserts and remote Wind Power on sea. Later on maybe remote Ocean Thermal can play a third role (by it constant 24/7 supply and also endless reserves very attractive). Both bio fuel and nuclear energy are not discussed in this analysis: both technologies have to do a lot of home work before they really can contribute to world prosperity and safety. Remote CSP facilities are located in the world's deserts. Their sizes are huge (as in square miles/kilometers. Their basic technology is very simple: 1) Sunlight creates warmth when it penetrates a subject. 2) When we concentrated sunlight it causes very high temperatures. We all have played with these two facets as children when we burn paper with just a magnifying glass. CPS is about concentrate sunlight at large scale with larges mirrors to heat a large volume fluid to very high temperatures. Temperatures that variables from 400 to 1000 degrees Celsius, depending on the used sunlight concentration technology. Than there are two options: 1) The fluid with very high temperature can be used to generate stream steam out of water and let that steam drives a turbine based power generator. This 'warmth to steam to energy' technology is very similar to the use of the warmth of burning coal to generate steam. 2) The fluid with high temperatures can be used to warm just air to high temperatures that powers a sterling motor based power generator. Both concepts can be used in mutual redundancy, or redundancy can be accomplished by hot fuel redundancy facilitating pipes between same or different installations. CSP can have as side product very clear (condensed) sweet water. Something valuable in desert environments or in the international market (as major cities become water quantity or water quality deficit). CSP installations will be build based on new glass technology (not only for the mirrors, but also for the structure, so no aluminum or iron frames), that will be produced on location (no limit to sand and energy in the desert). CPS projects can be combined with PV

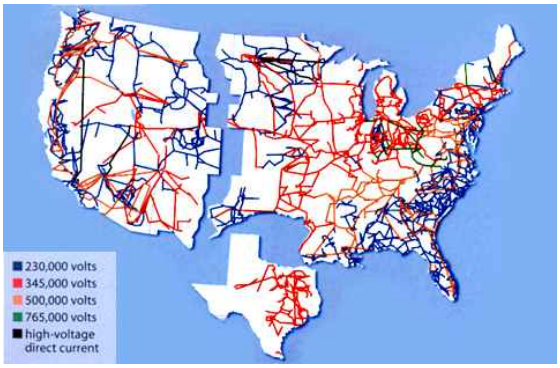
projects (on top of the seawater supplying -glass tech based- pipes from out the sea) and agriculture and housing under these by the cold seawater conditioned burning sun protected long PV based roof). CSP can be combined by bio fuel or fertilizer algae agriculture and fish farms on the soil under the mirror stands. CSP nearby locations are also the regions where energy intensive industries will move to (as there still will be demand for energy intensive products, what is disputable).

Remote Wind Power will be generated both 1) on sea and 2) on the world's steppes. On sea on structures made of glass technology, not by iron, because iron erode very much due the salty seawater and iron prices are skyrocking. Large floating frame's with wind mills on each crossing, or separate windmills with under water balance structures and by glass fiber cables. New variable generator will be used that are capable of working by both soft and heavy winds. Small ships with small helicopters on board will do maintenance. By the use of glass technology wind power will require less elements. These remote power will be transported to energy deficit cities by: 1) HVDC (inter)continental power lines (only 3% power lost per 1000 km distance) and the demand for HVDC cables will pushing the copper price to the max seen ever, or 2) by Hydrogen production and transport (by the huge prices of copper attractive, but more energy use in production), or 3) by energy intensive industrial commodities and products, or 4) by a combination of those three. Algae based bio fuels and fertilizers and the results of the fishing cultures will be transported by road.

CONTINENTAL GRID

Because not all local needed power will be produced locally, and not all national needed power will be produced national, power must be transported over long distances from the CSP plants in the deserts near the equator and from the wind-mill parks on remote costal locations to the consumption area's. This will be done by the new HVDC (High Voltage Direct Current) cables. These new international HVDC cable infrastructure also will have build-in fibers, providing new international fiber/digital connectivity (needed for the coming videocalling wave) between global North, Equatorials and South, because the HVDC networks will be go from Equa-torial Zone to the both North and South located energy deficit nations. Although the Internet is redundant in design by virtual routing to IP numbers (so thought the

whole Internet), start 2008 has showed that the connectivity with the Middle and Nearby East is still of low capacity and redundancy: one sea cable cut caused bad internet connections for weeks in many countries in that region. These new power demand driven (and also internet/telecom providing infrastructures) must be designed multiple way. There strategic importance is of that high value, that the must be build multiple redundant, with huge overcapacity. Otherwise the will be too easy to damage by terror acts, causing huge economic damages.



The build-in fiber networks must have long distance light (ZX technology) or build-in repeaters, lambda's (light paths) providing design and the attached can be upgrades as technology increase to more and more multi-colors, making the digital transport capacity unlimited: there are unlimited light colors and that will be the unlimited characteristics of these fiber networks. These new infrastructures demands large capital resources for both manufacturing and placement and will be mostly take sea routes, because the placement costs at sea are severe lower. Maybe this HVDC development also leads to break down of the current HVAC line tower based national power infrastructures, because AC power lines have huge transport energy lost.

LOCAL CAPACITY

An energy transition to local renewable production capacity is the ultimate solution. No other costs besides 1) on (possible long period spread) investment write downs that can have the same timeline as the repayments, 2) the finance interest, 3) some insurance and 4) some maintenance. But with two huge benefits: 1) no daily fuel costs (a huge benefit in times of PeakOil and the attached high fuel prices) and full independent (a huge benefit in times of PeakOil with power cuts and power shortages dangers).

Each roof, each wall, each window (when transparent PV technology enters the market) will be used. When higher surface/power capacities will reach the market new capacity will be added on different locations. Decentral energy generation funds will hire in long term contracts roof/wall/window space and supply the user which contracts will be part of the house by a sale. The same marketing/finance model of mobile phones will be deployed on power/water.

VIRTUAL GRID

The old grid concept is based on multiple central power generation and transport of that central generated power to the periphery of the grid. The energy transition to local production will make the local grid the design center and not the power plants. Therefore the power grid companies must get geographical redesigned: local, regional, national and international and making operational redundancy must become their main target. Central power generation model/thinking/focus must be replaced by decentral model. People must be able to deliver power to the grid general of specific to an affiliate, in that case transport costs must be calculated. Households and companies need new power indicators for this. Operators will research the new less power in transport losing HVDC technology, which will become more interesting by higher energy prices (when losses become expensive). Grid operators mostly also will play a role in central water or energy storage solutions. Historical power grids are designed for one way deliveries from power plants to power consuming factories, warehouses, offices, stores, homes, etc. But this model is outdated by the fact that decentral power production enormously has and will increase. The grid model will be totally different, fully designed for two way power traffic, from everywhere to everywhere. Energy meters will be more and more sophisticated than they're these days, because energy prices will be virtual and fluctuate each day and each moment of the day. Households, offices, ware-houses and factories will use energy for not direct needed purposes when its price is most cheap. Power management software (these days only used in large factories) will be used everywhere, and will be controlled by grid checks and grid keys. Industrial processes will be redesigned on low energy use and energy demand flexibility and will be managed inline with right energy purchase moments: using the energy needed when the energy price is the lowest. Connections can choose from which wholesaler they purchase their grid power demand and to which wholesales they sell their grid power supply. And this process could have several

layers with each a database driven if/than routine. Wholesalers will purchase live feeds and storage feeds. There will be dedicated power storage providing companies. Virtual peer to peer deliveries (virtual energy management clustering) will be possible, communicating virtual distances to the grid for transport fee invoice line. Like in telecom CDR's (Call Detail Records) are the basic of the invoicing database system, in grid administrations this will be the EDR's (Energy Detail Records). Grids will be geographically organized based on local identities. Each above layer will be virtual (regional, national, international). There will be a global grid database. This will be similar to a mixture of the GSM IMEI number, the IP route database (entry providers) and the database of the banks, with all the energy meters digital keys and GPS coordinates (longitude/latitude) for point to point distance calculations and options. Grids will be severely redundancy, with no overall organization (distributed hierarchical design like the internet) and if possible without needed root servers. Novell eDir can handle this energy data structures better than any other data structure available.

LOCAL IMPORTANCE

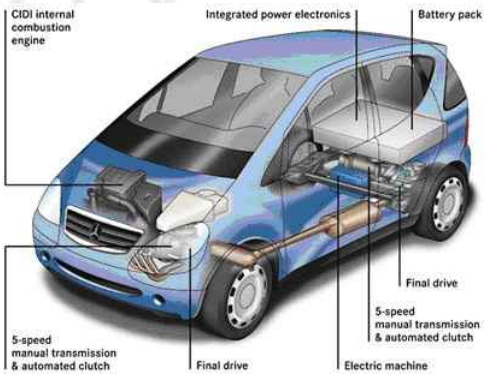
One of the strange solutions is that we must stimulate local economy and society importance more and more. Certainly a more local vital economy and more local vital societal is equal to less energy use. In times of more expensive energy this gives most value for money. This is easily said, but represents major economic and societal changes. Changes that are too huge to steer, but that steering is also not needed: the energy market, the ICT market and the media market will realize this automatically: The energy market by its effects of less commuting and less transport caused by high energy prices.

The ICT market by making the remote desktop technology and XML based desktops widely low cost available. The media market by improved geo-targeted ad technology and geo-targeted publishing technology. Localization is a huge part of the solution and comes for free. Of course this is a challenge for companies, for national governments (bye traffic congestion, bye roadpricing, hello complete set of new policy facets), for regional/national governments, for ICT companies, for media companies. But all these changes will be market drive and the first who understand localization will get the main part of these more bleu ocean type of markets

(attractive new markets where developments are more importance than competitor ship).

INSTALLBASE MIGRATION

One of the biggest challenges (and also biggest economic write down) is the needed change of our fossil powered installbase. This means everything that use fossil energy: Cars, trucks, busses, trains, tractors, forklifts, generators, planes, etc, etc. If transition needs to be done in a relatively short time period the much increased write down speed of the complete mobility investments will burden the economy again (after it's already burdened by high energy prices and negative economic growth). The Hirsch Report for US Department of Energy describes this problem extensive. This report concludes that transition has the lowest capital (and therefore economic) damage if transition could take place over a long period of 20 years, and that transition of the installbase will cost severely more if there was only 10 years to transite the installbase the economic damage will be severely, but it could be done, and when there was no time to transite the installbase before PeakOil occurred US DOE said it will lead to economic collapse. As it looks early 2008, by the price rises of oil/gas/coal (and elements and food), and by the still accelerating demand, despites the prices PeakOil is not over 20 years, and not over 10 years, but PeakOil is occurring right now. The Hirsh Report of the US DOE (Department of Energy) can be free found on the Internet in PDF format on http://www.netl.doe.gov/publications/others/pdf/Oil_Peaking_NETL.pdf. Transition of the installbase is a crucial and big part in addressing the PeakOil caused problems. Economic is will be finding a balance between new investments with lower fuel costs, or keeping old investments with higher fuel costs, for every company and household, for each fossil fueled device present or needed. Write down times will severely be shortened, installbase transition always has its price. Used fossil fueled devices will has severely lower than by investment projected prices.



Car lease companies who not anticipate on the value effects by PeakOil needed change of installbase of their fleet, will certainly go bankrupted, because the value of their fleet will be melting as snow in the sun due to PeakOil. This is the reason why renewable energy will become cheaper than fossil energy. Or better said: fossil energy will become much more expensive than renewable energy. The possibility of use of fossil energy in old fossil investments is the reason why the demand of fossil fuel will be still high, even when prices are very high and renewable energy

(electrical power) is cheaper. Even when renewable energy is available against lower prices, companies and people will purchase fossil energy because they don't have to buy or invest in new devices. Of course many of the existing investments will be convert to electrical power. Batteries or hydrogen plus fuel cell and electrical direct drive on 2 wheels will be made possible by dedicated car converting companies. Belgium has lowered the fossil fuel tax because of the high prices. This is not right. It will softens the hit, but increases the final damage. Governments must take their responsibilities in proclaiming the need of installbases severely. The best way to do that is by one simple fiscal legislation rule that allows quicker write down (shorter write down period) of fossil fueled investments. Of course energy will be severely expensive than it was in the good old days of cheap fossil energy. Of course the total mileage of commuting and transport will be reduced significant by these new high energy prices. Of course air travel and air transportation will totally collapse due the high energy demands, hydrogen based power would be possible but the energy demand of air travel and air transport is to high in times of severe higher energy prices and negative economic growth. People will not live on a whole year on minimal means just to go on holiday one week a year. Of course videocalling will replace traveling, but the installbase for videocalling is very easy to realize. But maybe new types of low energy airships will come. Other low energy demanding office technologies will find their way into the business world: remote desktop technology is already available, and one step further on that road will give full XML based office data structures. An other big issue for governments to promote. Wise governments stop traffic congestion policies (they will not be needed any more in times of PeakOil) and put the officials and civil servants that worked on that dossier and the already reserved budgets in proclaiming of remote desktop office in times of PeakOil. Mobility and transport seems to be the main problem area in transition, but that's not the truth.

All home/office/water heating in the most countries of the world are based on fossil fueled devices. They all must become electrical or hydrogen powered of replaced by other concepts (warmth pumps etc). All houses and commercial buildings will have PV solar panels on roofs and wall, roof rain water storage, waste water recycling, DC networks, power management unit met advanced software, etc.

SOIL TECHNOLOGY

In Holland is an (indirect) government owned company (Deltares: www.deltares.nl) works with a staff of 800 people on the development of double surfaced structures. Creating hollow dikes around provinces or cities, hollow levees besides rivers and hollow terps just in the cities or country sides. These structures deliver 1) water safety in low lands, and/or 2) commercial space under the elevate city landscape, and/or 3) new infra structures, and/or 4) cheap underground space for local food production. Suitable for each nation/city with water problems due low lands, each nation/city with space problems and each city that is food deficit (and that is each city). In these hollow structures industry and logistics can be located, infrastructures can be deployed and (most important of all) food production can be done by use of Grow|OS. Grow|OS is an open source agricultural operating systems that (by Crop Profiles: the right growth settings for a crop) facilitates the growth of fresh food in closed (surface) not sunlight exposed greenhouse structures. The Grow|OS attached devices emulate sunlight, temperature, soil moisture, CO2 levels, fertilizer, crop protection, etc, etc. Crop Profiles are the best performing setting for a specific crop, caught in a digital file. Soil technology and food production are the two sides of the same coin for each global city in times of PeakOil. The combination of both Deltares and Grow Indus can support nations and cities worldwide to realize relatively low priced water safety, industrial/logistical space doubling, new infrastructures and food production capacity. Soil technology can ease PeakOil effects for global cities.

FOOD TECHNOLOGY

The whole current agricultural system of commodities, dairy and fresh food is based on chemical fertilizers based growth. Chemical fertilizers are made by of air based N by use of large quantities of fossil fuel. The energy use (and thereby the price level) is: natural gas 100%, oil 130%, and coal 170%. Bio tech based fertilizers must be developed. Algae's that can be sprinkled on the soil simultaneously with sowing, capturing by biological powered process N from the air into or on soil. Furthermore the whole fresh food production in the northern parts of the world is based on very fossil energy intensive low tech types greenhouse agriculture. These old greenhouse will deliver food against very high prices by the fossil energy use of them.

Grow|OS is an open source agricultural Operating System that facilitates bio physical powered growth instead of fossil energy powered growth. Greenhouses could be located underground in/near cities, avoid transport costs and avoiding land use. Grow|OS is a software gateway bridge between greenhouse equipment and Crop Profiles (best settings of all equipment for a crop that gives the maximal growth in the shortest time against lowest energy costs). Crop Profiles addresses Grow|OS. Grow|OS addresses the equipment. By Grow|OS farmers don't have to become high tech specialists and device manufacturers don't have to become farmers. Crop Profiles contains the knowledge of the best farmer in digital sensor and feeding settings. Fresh food production in underground high tech spaces will become a capital driven industry where Crop Profiles are playing the ruling part and Grow|OS and the greenhouse devices/equipment just facilitate the Crop Profiles. The development of Grow|OS as switchboard between equipment and best settings, make it possible 1) for the greenhouse devices hardware industry just to port to Grow|OS and their equipment than can be used in each Crop Profile, without porting to each Crop Profile individually, and 2) for the greenhouse crop profile specialists (the ones with a deep knowledge of a specific crop) to define the best Crop Profile for there specific crop without the need to address all needed equipment directly. Grow|OS is build on Linux and is open source, but facilitates intellectual property protection for Crop Profile manufacturers. Agricultural Universities, Sees Enhancers and high qualified farmers will be the 'manufacturers' of Crop Profiles. Crop Profiles uses a lot of Bio Physical techniques (like light) and represses the need for GMO (Genetically Manipulated Organisms).

BIO TECHNOLOGY

All fossil energy based processes will be redesigned. Bio chemical processes will take over these huge markets in production processes. Bio chemical technology brings its own process energy. Fossil raw material for industrial processes is not more and not less than just a lot of formerly cheap C and H supply. Bio chemical technology will take the C from agriculture production of (more likely) from the air and the H from agriculture of just from water. Industrial processes based on bio technology brings their own process energy, it will be powered just by the sunlight and its warmth.

Bio technology will become the main stream in all the these days fossil C and H supply based production processes. Bio technology also will just out phase some industrial processes. The fertilizers of the future are not made in factories, but just

on the soil, but algae's that are spread on the soil before or simultaneously with sowing.

GLASS TECHNOLOGY

Elements and energy scarceness and high prices will lead to new substitute material technologies, that will replace elements more and more. Just because both production and economic processes that are based on low element/energy prices will face a difficult period in times of PeakOil. Element use has double head wind: rising element source prices and on top of that rising energy prices. This because the purifying process of natural appearance of elements to commercial/use state takes a lot of energy. New glass technology will replace iron and aluminum a lot because the commodities that are used in glass manufacturing are widely (as in: unlimited) available everywhere in the world. The desert states will become the new China of the world: producing al kid of glass products (there is enough sand and cheap CSP energy in the deserts). Glass technology is certainly a major economic development in times of rising element shortages.

ACTION PLANS

Awareness about possible heading problems is one thing. Knowing the situation by analysis is an other thing. But after that knowing how to address it and stimulate the needed changes is the next issue of importance. Every nation, every company and every household must make its own action plan as response on PeakOil. This analysis has an Action Plan attached. Using this as a blueprint will be a major headwind in defining the own specific solution for your economy, government, company or household. Action Plans give guidelines and are common sense creators. Making an action plan is a certain solution and part one of the action plan is creating and/or stimulating awareness.

FINANCE MODELS

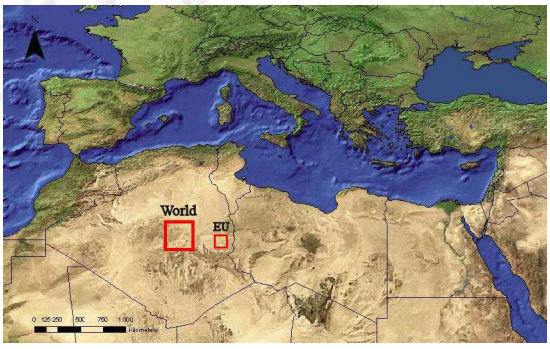
Making Action Plans is one thing: Knowing how to address it and stimulate the needed changes. Knowing how to finance the investments needed for these changes is an other thing. This analysis has a Finance Model attached. Use it to make your Finance Plan for the transition of your economy, government, company and household. The attached Finance Model is suitable, even in times of a wounded financial world by the American Credit Bubble Crisis. The Finance Model is based on both backwards and forwards guarantees, backed up by commercial and governmental guarantees. It's the only model is suitable of facilitating the huge capital demand needed for global transition away from Expensive Carbons. The Finance Model has two facets: 1) facilitating the finance of huge central energy investments for each economy worldwide and 2) by financial engineering attached to that huge central investments also creating a national equity fund of the same huge size as the huge central investments for making financing massive decentral investments possible.

INTRODUCTION

How to make a world that can serve the current 6.7 billion people (like ourselves) and all the newborns and give them a good life? The answer is simple and just one word: technology. Technology is the wild card that can cover population growth and prosperity growth. Not just any technology (blind technology believe), but technology that facilitate this target (smart technology use). Finite resources we can not multiple, people and their live we love and we want to facilitate as good as possible. Technology we can. It's possible. We must change some things (like energy waste), but life will be as good as or even better than know. Only if we act. Act in building the new needed technologies. All technologies we need are available yet, accept fertilizer technology, that's the only technology we must invent rapidly, all other technologies we 'only' have to deploy (on very huge and/or massive) scale.

CSP POWER TECHNOLOGY

Sun light is transferred into warmth if it hits the earth surface. With mirrors this light can be concentrated and it warmth can become heath (like burning paper with just sun light and a magnifying glass we did in our youth) and can be used for making electrical power the same way as we do as we burn coal in coal to power plants (warmth gets steam, steam powers a turbine, turbine makes power. So warmth based solar power, which is known as CSP: Concentrated Solar Power (http://en.wikipedia.org/wiki/solar_thermal_energy). Large 'farms' in de desert could do this for us. The technology is simple, not experimental but proven, although of course the technology can be improved by use (for example by the use of sterling engines instead of turbines).



Only use of small pieces of the Sahara could supply the whole earth (each economy of the world) of current electrical power need (according to DLR: German Aerospace Center). It could facilitate the world power need exclusive mobility: current level of mobility uses too much joules, but by less mobility due higher energy prices mobility could also be electrical powered (by use of build-in chemical or hydrogen batteries). The main component of CPS is glass for both mirrors and construction parts, which can be made on modular industrial base locally of desert sand, which reduces the investment costs severely and increases thereby the

capital/output efficiency. The world has enough deserts on many locations for huge CSP projects and the new HVDC (High Voltage Direct Current) power transport (only 3% power lost per 1000 km transport distance) can transport this power to each economy on the globe cost efficient. The great thing on the CSP/HVDC combo is that it needs no operational fuel. The business model is just investment write down, interest and maintenance. No daily fuel/coal needed, so need daily additional costs. By this an other facet must be highlighted: fossil oil/gas/coal prices increase approximately 50% a year till they are not longer available. So no daily costs and no negative wild card (rising fuel costs), these two facets makes renewable energy so interesting. You know what you get, and will not face any economic wildcard, that makes any future calculation impossible. When the current coal price explosion hits the exploitation of power companies, and they see that there are no fuel costs and therefore no black holes in the exploitation CSP will become the most beautiful business case in the energy market. When this simple true hits the mind of power companies, oil/gas/coal will be abandoned very rapidly (or at least be replaced by decentral joint warmth/power generation). The CPS/HVDC combo is a mainly capital driven business model.

Capital and sun are the only two main ingredients, take in perspective that nations with deserts very much like to use them for own power generation and earning foreign currencies. That they can 'tax' the fact that the have deserts and that the sun shines brings a smile on each government nearby the equator. CSP will have a giant new geopolitical power impact nobody is waiting for, if the finance model isn't right. Only half the problem is solved if finite oil import addiction just will be trade in to endless sun import addition. The right finance model (based on mutual interest) or on addressing both daytime and nighttime solutions will prevent black mailing situations, which import by fixed lines always has: 1) threatening with power cuts, or 2) threatening with nationalization, or 3) suddenly increasing prices and taxes. This is a very good example that militarism is a thing of the past. The powers of the future are not military, but economic. Local solar/wind power is the best in terms of independency. Bilateral relations are the best and most solid if they are based on real mutual interest. The huge benefit of CSP is that it's a technological neutral development, as in a collection of some already decades developed technologies. Of course CSP can be improved, but mostly/only on production price. Even Saudi Arabia, which is the world's biggest oil exporter and oil reserves owner, plans to become an world leader in another, cleaner and renew-

able, field of energy by investing in solar power, both for own use and export, the country's oil minister (Mr. Ali al-Nuaimi) said in an interview in March 20088 with Petrostrategies: "For a country like Saudi Arabia, one of the most important sources of energy to look at and to develop is solar energy. In the same way we are an oil exporter, we can also be an exporter of power." They could do this power export by HVDC power lines, by Hydrogen or by manufacturing high energy demanding finished products (like fertilizers). There is certainly a need for a CSP knowledge company that exactly knows where worldwide the best CSP production processes can be bought. CSP knowledge and production will be two different types of economic sectors.

PV POWER TECHNOLOGY

Sunlight can be used by light based solar power, which is known as PV: Photo Voltaic (http://en.wikipedia.org/wiki/photovoltaics). The challenges the PV industry globally faces are technological improvements that addresses the three most important PV facets: price/power, size/power and montage/integration, these are the three technological directions there are in PV. Technology is what rules in PV. Manufacturers will specialize themselves on one production process (their specific market weapon) and focus on one product specification (price/power, size/power or montage/integration). The production processes will different per chosen USP. Most manufacturers will operate by just one production process and try to reduce costs by manufacturing volume. A dedicated PV technology company as Nanosolar (funded by Google) goes for price/power and offers solar cells with a price of $ 1 per peak watt hour. There will be PV tech development companies, PV cells in license manufacturing companies, PV system manufacturers, PV sales companies, PV installation companies, PV maintenance companies, PV financers and PV operators. Worldwide each roof, each wall, each window will have (integrated) PV technology. Building bricks will have build-in PV technology, glass windows will have build-in PV technology, solar protection screens will have build-in PV technology, and roof panels will have build-in PV technology. The energy use/production of a house will be a crucial part of the market price of a house. Carbon based power prices are these days relatively low, due to multi year coal purchase contracts. But due to the fact that the coal prices have risen more than the oil prices and these price increases will hit the market, later due the long period contracts, but they will hit the carbon power cost price very hard in 2009 and beyond, coal is on its way up, even more accelerating than oil. It’s amazing that there are no power price projections for 2009, 2010 and 2011. PV sales models are just born and not yet full grown. Certainly there will be PV sales/finance models that are mortgage bank driven and direct mortgage attached, as they are build on/in buildings and lower the costs of living severely in times of PeakOil. Banks certainly will like to finance PV more than just blank consumer credit. PV finance gives the banks a pledge and make their customers more rich on energy production instead of more poor on spending. Besides banks, also power (both generation and sales) companies (as soon as they understand central power generation is no longer a good business model) will enter the decentral PV market. And also the telco’s, the water companies, the hardware chains, the retail chains and the insurancers. Plus dedicated both old and new (both trade and installation orientated) players. The energy market is huge, so the PV market will be huge.

All players will compete on performance, price, finance model, interest rate, installation, maintenance, looks, delivery time (important facet in an exploding market), micro management system, micro dc network, power purchase models, power delivery models. PV operators will hunt for each not used roof/wall/window space. No cash-out deals will rule the market (similar as the market penetration of GSM). Cities will stay energy deficit (as they are also food deficit, if they not use the Grow|OS solution in special designed hollow terps/dikes). PV technology will mostly be used decentral, building integrated/attached. The market boost really will come if PV goes transparent and will be integrated in glass windows, but that's not the case yet. Decentral power generation also contributes to power conservation as it eliminates the power lost of the current HVAC power infrastructure significant. There is certainly a need for a PV power knowledge company that exactly knows where worldwide the best PV production processes can be bought. PV knowledge and PV power equipment production will be two different types of economic sectors. Installed PV power capacity is all about 1) initial costs, 2) maintenance costs, 3) local annual light hours/intensity and 4) fossil originated power market prices.

WIND POWER TECHNOLOGY

The worldwide possibilities of wind power are just only slightly discovered. As oil prices will reach levels of above $ 200/300 wind power (both huge central and massive decentral) will be a very attractive business case or investment. Wind power technology is yet not developed full as many sources states. The wind speed flexibility both in any wind power generating technology, as in heavy wind force regulation (water filled flywheels) certainly can be improved. The initial/setup cost prices can be lowered with certainly 50%, improving the wind power investment versus revenue rates severely, certainly in times with doubling oil prices.

There is an enormous challenge for huge central parks on seas, steppes and sea sides. Everywhere the wind is blowing wind energy is attractive. There is also an enormous challenge for massive decentral windmills nearby cities/villages and on building roofs. On roof these windmills will be vertical axed (most quiet and less vibration) and there will be 1, 2, 3 or 4 windmills on each roof (one on each corner). By the enormous volume of this contributing severely to the decentral power generation wave that will taken place when the current coal price rise will hit the corporate/household consumers globally delayed in 2009 The one year suspension is caused by the contract long term coal purchase contracts power companies have. The power companies all hasn't except the fact current huge coal price rise and are still in denial concerning future high prices. Cheap and abundant coal is over. Coal power is becoming expensive, even without the expensive CO^2 capturing and permanent storing solutions. Building new coal power plants is not wise, as China already build 500 mega size versions of them. The global coal reserves are fairly overrated worldwide and low price exploration has certainly become something of the past. Wind power is all about installed capacity. Installed wind power capacity is all about 1) initial costs, 2) maintenance costs, 3) local annual wind hours/intensity, and 4) fossil originated power market prices. New ships will also been build with retractable windmills as fossil fuel prices rises more and more. As the wind market accelerates by rising fossil energy prices cash free windmill initial (purchase/installation) payment models will occur on the market, mainly driven by financials backed manufacturers, retail chains, web shops, banks, telco's, installation companies and current power companies, (driving the volume to maximum levels, like it have done in the GSM market) and also placement locations will become a market of its own. Companies and households mostly will decide to do an overall decentral power investment, but the partial solutions certainly will gain market share in the early stage of the massive decentral energy generating capacity market. There is certainly a need for a wind power knowledge company that exactly knows where worldwide the best PV equipment production processes can be bought. Wind power knowledge and wind power equipment production will be two different types of economic sectors.

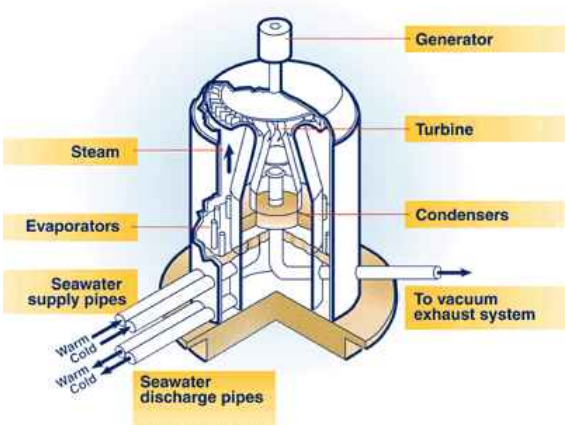
WATER POWER TECHNOLOGY

The generation of water power in macro projects has an enormous short distance upstream impact on the regional environment, but also generates huge quantities of power with almost no daily costs. Huge water power projects are mainly capital driven projects with a lot of environmental impact. The fact that clean sweet water will become more scarce and gets a commercial value will be a huge supporting factor for future macro water power projects. This is also the second major impact of huge water power projects: the also huge long distance downstream effect. After a dam is realized, the river will get sometime a severe lower volume, till the reservoir is full. When the filling of the reservoir is done in times of water oversupply and is done wisely in relatively slow speed, the long distance downstream effects will be almost zero. When the dam is build maximal solid and not build in speed, the dam will be safe and give also no downstream flood danger. Power can be transported with less power lost to the consuming cities by HVDC infrastructures.

The volume of quantities micro water power possibilities are very under valued the last 100 years. This will change. Multiple micro water power maybe will even replace single macro water power plans. Voluminous micro water power has a good future for local rural communities all around the world. Like in the old days cities are grown on river crossings etc. in the future multiple rural cities will be around the future micro water projects. Serving power and water to those cities. Fulfilling the two crucial demands of each current and future cities. There is certainly a need for a (micro, mesa and macro) water power knowledge company that exactly knows where worldwide the best PV production processes can be bought. Micro, mesa and macro water power knowledge and water power equipment production will be two different types of economic sectors.

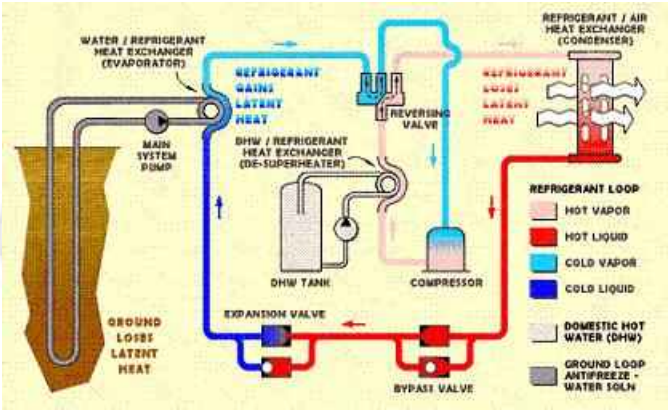
THERMAL POWER TECHNOLOGY

Available in a volcanoes water, an ocean water and an artic water/air based model. The volcanoes water based power generating model uses the by the local earth activities instant available (continue by the volcanoes activities of the area being heated) hot water locations, which can heat water in of iron (or of new glass tech) made water pipes till 100 degrees Celsius. This water becomes steam powers an electricity making turbine. Or it will be used to heat air that powers an electrical power generating sterling motor. The power can be transferred by HVDC infrastructures to the nearby (as in thousands of miles and/or kilometers away) global cities. It also can be used to produce energy intensive products for the global market (aluminum, fertilizers, glass tech, etc). It also can be used to power the on that locations made new datacenters of the world. In case of Iceland, cooling would take no extra energy -normally by datacenters 70% extra power demand for cooling activities- or even could be used to heat house or fish farms. It also can be used to produce hydrogen for the global energy market. There is certainly a need for an ocean thermal energy knowledge company that exactly knows where worldwide the best ocean thermal power production processes can be bought. Ocean thermal power knowledge and ocean thermal power equipment production will be two different types of economic sectors.



The ocean based power generating model is based on exploitation of the temperature difference between top layer ocean water (25 degrees Celsius) and deeper layers (5 degrees Celsius), the 20 degrees temperature is used to generate electricity. Geo thermal can be used in volcanoes areas to produce power. Both micro and macro. Iceland could produce all on grid power demand of their whole economy, completely by her geo thermal natural resources. They could also use the electrical power to power their car/truck/bus mobility (by batteries or by hydrogen) and ships engines (by hydrogen, needs transition of installbase, will be done as fossil fuel doubles again in price). They even could export power by HVDC to 'nearby' cities. In case of Iceland: Europe, Canada and/or the USA or (maybe better solution by less infrastructural investment need) become an important global hydrogen supplier. These ocean thermal energy power factories can be located on-shore on locations where both 5 degrees Celsius deep ocean (by isolated pipes) and 25 degrees Celsius (surface water) are available (transport of power by HVDC to 'nearby' world cities of as hydrogen for the world market. Or off-shore on floating structures on deep seas (mostly hydrogen production). For more information on ocean thermal power see http://en.wikipedia.org/wiki/ocean_thermal_energy_conversion). There is certainly a need for an ocean thermal energy knowledge company that exactly knows where worldwide the best ocean thermal power production processes can be bought. Ocean thermal power knowledge and ocean thermal power equipment production will be two different types of economic sectors. The artic air/water based power generating model is based on the temperature difference of the sea water (0 degrees Celsius) and the air temperature (40-50 degrees Celsius) in the pole regions. So the temperature difference could be even more than 40 degrees Celsius (double of ocean thermal power systems) and by the fact that more the temperature difference is, the energy production equally rise, the Polar Regions are perfect locations for thermal power generation. Transport of power could be done by HVDC cables to the cities in the northern hemisphere, of by hydrogen in ships or pipes. There is certainly a need for an artic air/water thermal energy knowledge company that exactly knows where worldwide the best arctic air/water thermal power production processes can be bought. Artic air/water thermal power knowledge and ocean thermal power equipment production will be two different types of economic sectors.

THERMAL CLIMATE TECHNOLOGY
Thermal climate technologies use extra building warmth or coldness for adjusting intra building temperature. There are two types of technology: direct and indirect: Directly uses only pipes/pumps. Indirectly uses pipes/pumps and an additional (warmth in- or exporting) warmth pump. There are three forms of thermal climate control sources: geo, sea/river and air. Central technology in thermal climate technology is the warmth pump technology. There is certainly a need for a warmth pump knowledge company that exactly knows where worldwide the best warmth pump production processes can be bought. Basically warmth pump knowledge and warmth pump equipment production will be two different types of economic sectors. Geo thermal climate technology explores the temperature differences between in-building temperatures and geo temperature. Using these differences to heath or to cool in internal climate and water temperature demands (washing, showering). Technologies are based on direct (pipe/tube) or indirect (warmth pump) technology. As warmth pump technology performance increases (lower energy use, higher performance, exploring even small differences), geo thermal climate technology will gain huge market shares in building climate technology. There is certainly a need for a geo thermal climate knowledge company that exactly knows where worldwide the best geo thermal climate production processes can be bought. Basically geo thermal climate knowledge and geo thermal climate equipment production will be two different types of economic sectors.

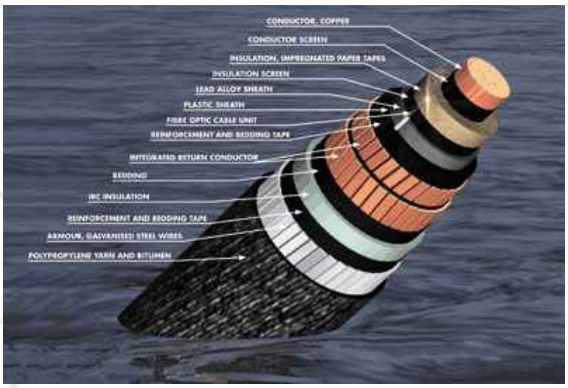


Sea/river thermal climate technology explores the temperature differences between in-building temperatures and sea/river temperatures. Using these differences to heath or to cool in internal climate and water temperature demands (washing and showering). Technologies are based on direct (pipe/tube) or indirect (warmth pump) technology. As warmth pump technology performance increases (lower energy use, higher performance, exploring even small differences), sea/water thermal climate technology will gain huge market shares in building climate technology. There is certainly a need for a sea/river thermal climate knowledge company that exactly knows where worldwide the best sea/river thermal climate production processes can be bought. Basically sea/river thermal climate knowledge and sea/river thermal climate equipment production will be two different types of economic sectors. Air thermal climate technology explores the temperature differences between in-building temperatures and the outside air temperatures. Using these differences to heath or to cool in internal climate and water

temperature demands (washing/showering). Technologies are based on direct (pipe/tube) or indirect (warmth pump) technology. As warmth pump technology performance increases (lower energy use, higher performance, exploring even small differences), air thermal climate technology will gain huge market shares in building climate technology. There is certainly a need for an air thermal climate knowledge company that exactly knows where worldwide the best air thermal climate production processes can be bought. Basically air thermal climate knowledge and air thermal climate equipment production will be two different types of economic sectors.

NETWORK TECHNOLOGY

Remote power generation demands transport of power from generation area's to consuming areas. Before the development of the HVDC (High Voltage Direct Current) technology, transport of power was very expensive due to the relatively high power loss and higher installation costs of the former dominating power transport dominating HVAC power lines. The HVDC technology has fixed this huge problem of power transport reducing it to +/- 3% per 1000 km. Without the HVDC technology remote power generating was only possible by the old HVAC technology or by hydrogen (generation and regeneration lost) as transport media.



The only 3% power lost per 1000 km from HVDC technology is economic acceptable. Also are the investment and maintenance costs of HVDC power infrastructures much, much lower than of HVAC power infrastructures. The WorldBank sees certainly a new reason of existence in an in short time completely changed capital world (examples: Russia that just pays of her international debts completely and just overnight, or China that finance some African Nations) in financing international and intercontinental HVDC networks for energy based bilaterals and multilaterals (see PDF on http://www.worldbank.org/html/fpd/em/transmission/-technology_abb.pdf). The HVDC network technology makes remote power generation economic possible in terms of investment write downs, maintenance costs and power lost. Power will be generated far away from consumption areas in deserts, seas and steppes. HVDC infrastructures will be mainly sea route based, as they are used isolated sea capable cables.

HVDC cable build-in fibers will also improve the density of the international fiber networks on just routes now have less density and less capacity, connecting the Emerging World digitally more and better with the rest of the world. This fiber facet of HVDC intercontinental networks will be an extra reason why desert owning states will be very interested in huge CSP farms in their deserts. The more giant they are the more capital will be available for network redundancy and improves their digital connection with the world and even will give them a digital hub capacity. By huge desert based power generation projects (huge as in several hundreds or even thousands of TWh) redundancy in HVDC networks is crucial, both on generating side (removing the energy), as on the consuming side (receiving the energy). Redundancy makes networks less to totally not attractive for terroristic activities. Blowing just a few cables than will not have any total network impact. It just damage the cables and multiplies not the effect (one thing terror always achieves).

GRID TECHNOLOGY

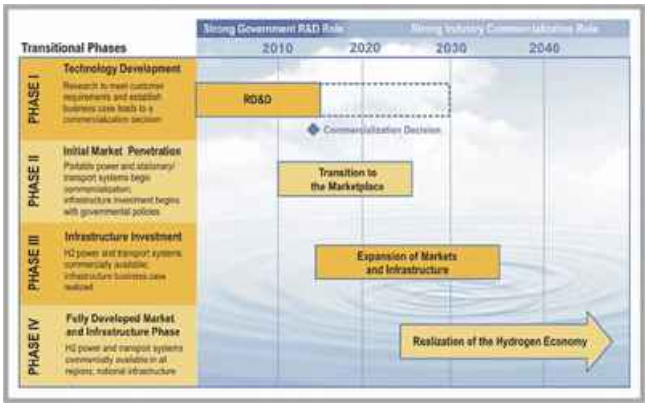
The old grid concept is based on multiple central power generation and transport of that central generated power to the periphery of the grid. The energy transition to local production will make the local grid the design center and not the power plants. Therefore the power grid companies must get geographical redesigned: local, regional, national and international and making operational redundancy must become their main target. Central power generation model/thinking/focus must be replaced by decentral model. People must be able to deliver power to the grid general of specific to an affiliate, in that case transport costs must be calculated. Households and companies need new power indicators for this. Operators will research the new less power in transport losing HVDC technology, which will become more interesting by higher energy prices (when losses become expensive). Grid operators mostly also will play a role in central water or energy storage solutions. Historical power grids are designed for one way deliveries from power plants to power consuming factories, warehouses, offices, stores, homes, etc. But this model is outdated by the fact that decentral power production enormously has and will increase. The grid model will be totally different, fully designed for two way power traffic, from everywhere to everywhere. Energy meters will be more and more sophisticated than they're these days, because energy prices will be virtual and fluctuate each day and each moment of the day. Households, offices, ware-

houses and factories will use energy for not direct needed purposes when its price is most cheap. Power management software (these days only used in large factories) will be used everywhere, and will be controlled by grid checks and grid keys. Industrial processes will be redesigned on low energy use and energy demand (changed from the most cheap production factor, to the most expensive production factor) will be automatically flexible managed inline with the right energy purchase moments: using the energy needed when the energy price is the lowest. Connections can choose from which wholesaler they purchase their grid power demand and to which wholesales they sell their grid power supply. And this process could have several layers with each a database driven if/than routine. Wholesalers will purchase live feeds and storage feeds. There will be dedicated power storage providing companies. Virtual peer to peer deliveries (virtual energy management clustering) will be possible, communicating virtual distances to the grid for transport fee invoice line. Like in telecom CDR's (Call Detail Records) are the basic of the invoicing database system, in grid administrations this will be the EDR's (Energy Detail Records). Grids will be geographically organized based on local identities. Each above layer will be virtual (regional, national, international). There will be a global grid database. This will be similar to a mixture of the GSM IMEI number, the IP route database (entry providers) and the database of the banks, with all the energy meters digital keys and GPS coordinates (longitude and latitude) for point to point distance calculations and options. Grids will be severely redundancy, with no overall organization (distributed hierarchical design like the internet) and if possible without needed root servers. Novell eDir can handle this energy data structures better than any other data structure available.

HYDROGEN TECHNOLOGY

Hydrogen is the perfect energy storage and transport (making it an offline -as in later on useable- instead of live -as in second later not existing-) medium although it's highly explosive. Its storage and transport is relatively cheap and it can be pumped over very quick as liquid from ships to terminals, from terminals to distribution trucks, from distribution trucks to gas stations and from gas stations in to cars, trucks, busses, tractors and all other special transport equipment. Hydrogen is just a storage/transport medium of energy. Hydrogen is not a basic source of energy, it's just a storage form. Hydrogen must be made and this process (like all other processes) has an energy use of its own. When the conversion rate can be maximalized (less energy use of the process) hydrogen is perfect because it combines energy storage and energy transport.

The install base is the problem. There is not any hydrogen installbase yet. Not in production (power to hydrogen), not in transport, not in distribution, not in sales and not in use (converting it back to electrical power). Hydrogen can play an important role in leveling the energy prices, when live energy will be priced based on actual live supply/demand market mechanism. Hydrogen than can be used by households, companies and grid connected power providers to fill the gaps between supply and demand (which will be the high priced part of the energy market of the future).



Jeremy Rifkin is the hydrogen economy 'apostle' of the world, with his international enormous impact having book "The Hydrogen Economy". HVDC is for fixed line electrical power use maybe a better, cheaper and simpler solution. When cars

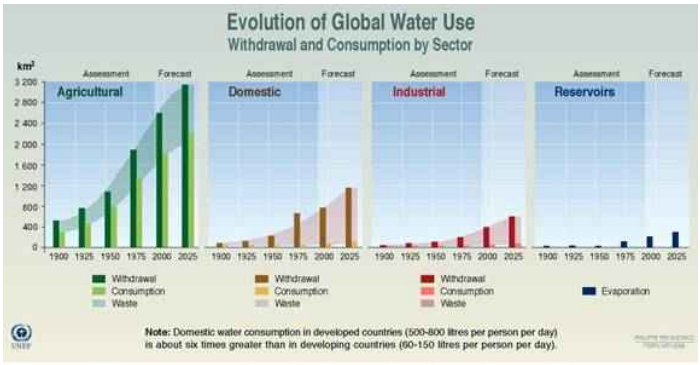
become hydrogen powered they can deliver (paid) power to the home, company and grid when needed. Hydrogen has a huge benefit that it combines storage and transport and therefore can be used as low weight battery replacement in mobility/ transport vehicles.

STORAGE TECHNOLOGY

For fixed line connected power use, may be other grid attached storage solutions will be better (as in: cheaper, more efficient and much more simpler in operation) and yes also hydrogen can play a role in this more automatically grid connected storage. Grid connected storage has function to provide commercial online power against higher than regular prices when there is a live energy shortage. As also explained later on: electrical power will have soon a live price, based on grid supply and demand and all companies and households will have energy management units, which manage energy use and energy purchase/supply. Other energy storage technologies that are based on chemical or spinning concepts are may be voluminous and expensive. There are too much energy storage technologies to mention, so let's look at their economic facets: investment, space demand, efficiency, cost of operation and interest costs. It's clear that live energy feeds are simpler, but when they must come at night from the other end of the world and therefore travel al least 20.000 kilometer with an average 3% per 1000 km lost, it's also clear that live feeds in times of gaps between supply and demand (mostly at night, day time energy can be made by CSP in any volume). Energy storage is a complete new world to discover and commercial very attractive because it sales will always be at the top levels of energy prices (when they are needed). Hydrogen has as huge benefit, that it has no joule based limit or better said: storage facilities are relatively cheap and could therefore be made abundant in volume. This limitation in capacity is something almost all other solutions have: A water basis based energy storage system has gone empty after several hours of operation. Huge sea based circle dikes created artificial lakes, or in land reservoirs are also storage options, but have at least just a 50% efficiency (losing 50% of the power in pumping water up). By sea based circle dikes created artificial lakes, this could be less when water pumping upwards is done by high tide and power generation is done by low tide, but this could not match the storage and generation oversupply/overdemand power market situation.

WATER TECHNOLOGY

Water shortages are no longer an only Africa and Middle East related issue. China has huge water deficits in both her cities (accelerating demand of household and industries) and in her rural area's (caused by increasing agriculture, industrial and household demand versus stable but polluted supply). Southern Europe has severe water deficits. Some areas of the USA suffer from draughts.



Water is the oil of the 21st century and will increase each year more economic value and therefore popularity. The main problem for the Olympic Games in Beijing has 5 characters and is called water. China will close all water consuming industrial activities during the games. Water supply capacities of almost all cities, communities and agricultural area's all over the world have reached their maximum capacity. Beside clean, sweet, fresh water, the waste water situation is becoming more and more also a problem and is very much attached to the clean water use and demand. More water use is more pollution and contamination input of surface waters. The huge demand for fresh water of cities (both by use per citizen and by grow of number of citizens) will lead to new huge water power projects with ditto water reservoirs. Water will be transported more and more from further distances, with ditto increased prices and supply interruption risks. Water reservoirs and water pipelines become more and more attractive for terror action. Societies must prevent terror not by becoming a police state, but just by infrastructural design, not one source and multiple redundancy in sources, pipelines and control and/or management centers. Rain water will gain enormous importance. Collecting, filtering and storing it will become every building will do. Both macro (dam created reservoirs) and micro (roof water of each building). In the greenhouse industry this is already common practice worldwide. Belgium and Germany has both installed legislation that each new building must store its own roof rain water. This demands enormous quantities of collecting, filtering, storage and re-use 'technology' (washing, gardening, cleaning and toilet flushing). The benefit of this micro focused legislation is also that cities/villages (almost all on their waste water top capacity) don't have to install new huge central equipment. The benefit for the building is cheep water and having own water reserves in time of supply interruptions, pollutions/contaminations. The benefit for the direct surrounding of buildings is less mud (flood) risk by heavy rains. Some of these roof water solutions also inject oversupply in the garden soil around the building, to improve ground water levels without wet surfaces.

Rural houses and villages will also have their own wells. Virtual water is remote water use by purchasing remote manufactured products or grown material/food. Agriculture will be priced by water consumption. Also local agriculture. Grow|OS (an agricultural greenhouse automation platform) can reduce the water use of growing fresh food severely. This is why Grow|OS also will be used (with artificial light) in the tropical regions. Some led light power will be cheaper than huge water lost by evaporation in the open field. CSP (Concentrated Solar Power) and TP (Thermal Power) installations could also produce water as side product, which could be transported by mega tankers to the seaside cities of the world. Offshore (near coastal area's) there are huge under sea soil sweet water natural reserves. These could be used the same way as ground water is used (using till is away). Water reserves are finite reserves. We need a lot of reality wakeup calls before we will see water as a scarce available commodity. Clean water infrastructures are in most part of the world old and have efficiency rates of just 75% (25% leaks out of the infrastructure, and give the same time infrastructure contaminations a change). Investments in new clean water infra are huge investments for cities. Sewage infrastructures world wide have to small capacities and are old and leaks contaminated water into the clean ground water reserves. The risk of cutting of owns future water supply by this is gigantically. Sewage over capacity dumps by heavy rain polluted all surface water in that region. Micro solutions are here also available and the best solution. A micro sewage system per building is a complete new technology. Water Indus has build the technological designs that can be manufactured in each type of economy (western till primitive). Delivering/guaranteeing clean surface waters, clean soil waters, water recycling. As said earlier: water is the oil of the 21st century. Philips has made the water 'Senseo' for India, cleaning and cooling water in one small device. Water technology is just started.

FERTILIZER TECHNOLOGY

Maybe we're able to solve the fertilizer transition. Is it not solved, but maybe we can. But the bio chemical science world must take this very seriously and make it to their main target. Certainly the people who will find and be able to cultivate the algae that as an on location bio active fertilizer can be spread on soil and capture N^2 from the air bind it to other elements will get the Nobel Price for peace. Because they will be the people who will made feeding the world (all it's currently 6.7 billion, and future 9.0 billion people) during and after PeakGas possible.

And it will prevent a situation where Russia (more specific: the 3 headed board of Gazprom), Qatar and Iran can decide who gets to eat for a reasonable price. This by the fact that the current fertilizer production process is mainly based on the chemical characteristics of natural gas and only Russia and Iran yet has the large reserves of natural gas left that is required for fertilizer production. Oil (+30% more energy needed) and coal (+ 70% more energy needed) can be used, but are much more energy inefficient in use by fertilizer production.

GREENHOUSE TECHNOLOGY

Fresh food production will become local and very high tech by use of Grow|OS. Grow/OS is a transparent conversion layer between a wide variety of greenhouse sensoring and controlling hardware on the one side and the best crop specific settings software files on the other side. What will be the effect of Grow|OS? Grow|OS makes it possible to convert the right crop settings to sensors and switches and integrated functional units of which the maker of a crop profile never has heard of. It makes crop profiles hardware independent. Crop profiles just gives the right setting values placed in a time frame to Grow|OS and Grow|OS make sure that these values are realized. Grow|OS is best to described as a translating of commanding agency. Farmers or institutes define the best (max result, lowest energy use, just in time harvestable) settings in a time frame (Crop Profiles). They don't have to worry about reading from and talking to technology: that is what Grow/OS does for them. So they make their best settings and Grow|OS 'translate' these to the hardware that realizes these settings for them. Grow|OS will have a huge effect on agricultural production and therefore on the agricultural market. Crop maximalization treatment knowledge will be 'kept' of 'put' in just a crop setting specific datafile that can deployed anywhere in the world. It will initiate a complete revolution in greenhouse based agriculture. Now crop specialization and scale enlargement is the number one development (because crop knowledge makes the profit), after/by Grow|OS, crop specialization and scale enlargement will completely descend as developments of the past.

Farmers (and even just capital investors) will be able to grow any crop the best way in any (also low) qualities with the best quality and for the lowest costprice. Off-season and off-climate. As close as possible to the consumption areas. Grow|OS will change both agricultural production and availability of its products placed in seasons tremendously. Grow|OS will made vegetable, fruit, flowers, herbs and fish affordable available to any world inhabitant, even when oil prices reaches rocket high positions and in areas where soil is very expensive. Grow|OS also will have impact on the way urban development plans will be designed. Creating underground food production facilities that don't consume expensive earth surface soil/space.

DIGITAL TECHNOLOGY

Digital technology can offer a huge contribution to the energy demand of economies. Remote office technologies (early stage: remote desktop technology, final phase: XML technology) can take out at least 80% of the energy demand of commuting for economies. Videocalling will take out at least 50% of the energy demand of business traveling for economies. As energy and paper prices rises, leaflets, magazines and newspapers will more and more going digital, just because the paper based duplication/distribution model will become to expensive, and also because advertising income moves more and more to digital media, because they offer the advertiser effect statistics. Some digital technology will be rolled-out very easily (videocalling and media) because they offer instant 'plug and play' facilities. Other digital technologies will be rolled-out much less easily (remote office technology), because it demands redesign of processes and models.

BIO TECHNOLOGY

Bio technology will become the other frontrunner in technological development, besides energy technology. Silicon Valley her research and venture capital is already switching away from computer technology. Bio technology has the huge opportunity to feed its own process energy. For energy intensive processes this is in times of PeakOil a huge technological head start. Bio technology is just in the beginning of its technological growth. After the invention of cheese it was several thousand years very quiet on the bio tech. The huge advantages make currently in bio tech research and in realization of bio tech based production lines are certainly a huge tail wind in times of PeakOil.

GLASS TECHNOLOGY

As elements supply will deplete, glass technology will rise enormously. Glass technology will replace a lot of the aluminum and iron demand in the global economy. Replacing copper by glass technology is not possible, because glass is an isolator. This will be a problem because the world needs copper in large, very large quantities as the world switch from combusting motor based power to electrical power. Glass can be formed in any form, and doesn't oxidize and erodes very slow. Like by concrete, glass will be enforced with high temperature resistant fibers. Glass will replace iron a lot, even as concrete is replaying iron also a lot. Even the Petronas Twin Towers in Malaysia are completely made of concrete, without a steel frame (something to big for such basic material changing experiments was the common thought by that). All glass structures will get attached or build-in solar cells. Skyscrapers will become energy neutral by this change. All skyscrapers their outside will be replace with new glass technology.

INTRODUCTION

There are certainly some severe global economic/technological/societal tailwinds that soften the economic damages caused by the effects PeakOil and Climate Change.

INCREASING EFFICIENCY

The global economy/society is technological driven. Technology invents it selves continuously over and over again. Technology is 100% equal to self-improvement. Specifications are all that matters in technology. This is the reason that efficiency grows each year. Higher energy prices will boost technology in a less energy using direction. Efficiency gives equal/more prosperity by less/equal resources. We all know that increasing efficiency mostly leads to more prosperity (use), than it leads to less energy use. But increasing efficiency is certainly a huge tool in the prosperity / energy balance. And we get this for free of technology.

INCREASING LOCALIZATION

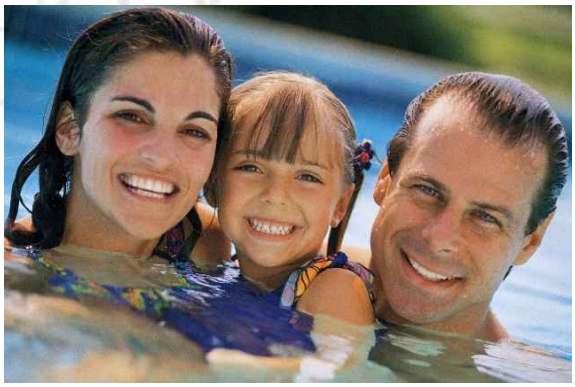
There are many reasons why localization will increase the coming year enormously. The first reason is high energy prices. They make mobility and transport more expensive. The market mechanism that triggers both local anything in favor of not local anything by each choice. The second reason (caused by the first one) is that job miles will reduce: people will search jobs closer to home, this will increase enormously cause a more 'local root' feeling, with large societal effects.

The third reason (also caused by the first one) is that the number of 'food miles' will reduce, from now roughly average approximately 1500 miles / 2500 km, to a more local/nearby food production. The fourth reason is independent from the first one but very complementary on it is: geo-targeted ad technology. Advertising will be more and more geo-targeted: Google Adwords already offers local advertising. I-Local is a geo-targeted database driven online model type like the old Yellow Pages. Local production/deliver of products and services will grow tremendously:

avoiding energy spills and time spills and therefore give more value for money. The fifth reason is also independent from the first one, but very complementary to both energy prices and local ad demand: is geo-targeted media (as in local digital media). These will yet boost when large national media corporations launch or a local dedicated digital portal structure, or a combined national/local digital portal structure. The sixth reason is the rise of use of remote desktop and xml desktop technology, which make office locations less important in corporate function. Office people will more and more work at home of in 'desk hotels' in their home town. The localization caused by high energy prices and the strong increase of geo-targeted advertising both will boost local media structures powered by the large national media corporations. An integrated combination of a publishing engine and an ad engine, operated partly national by the exploitation corporation and partly local by franchisers. The news reporter with wireless/mobile video/audio (as in quality phone) will be back on the streets of the cities (fulltimers and freelancers) and villages (freelancers). Local will become hip, the place to be, this will increase quantity and quality. Local events will get the exposure they deserve and will be more crowded (and therefore better, nicer, more quality, more quantity) than these days. High energy cost and geo-targeted advertising and geo-targeted publishing will boost localization: a more local (distance avoiding) focused economic, societal and mind development. Localization is no isolation. Localization is just using less energy.

INCREASING WELLBEING

Higher energy prices have not only negative effects. Less commuting is certainly a life improvement: work (as in earning income and life pleasure) gets a huge negative facet less: commuting. Less commuting travel each day, is equal to less stress each day, is equal to each day more time for the good things in life, is equal to more rooting in living surrounding.



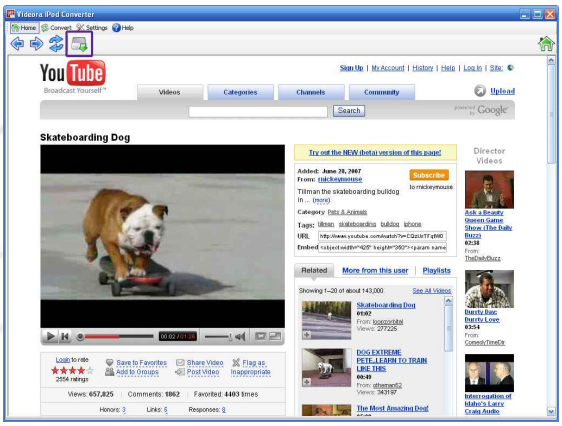
We get this all for free by less commuting by higher energy prices. When oil prices makes commuting a luxury, general commuting will disappear and only high paid specialists and management will get commuting fees from companies. Luxury joint commuting also will rise: luxury busses with less seats, orange jus, good coffee and the newspaper/notebook: much more better than driving in traffic congestion.

LESS SPILLS

When energy, elements, material and food become much more expensive spills almost automatically stops. We get less spills for free by higher prices of energy, elements and food. So the dogs will get more household food leftovers instead of canned Pedigree Pal, because Pedigree Pal will become too expensive for many families. Who cares? The dogs certainly not.

LESS MAINSTREAM

Due to internet based technology, media consumption time has become very fragmentizated the last years and this development is yet started and certainly not on its maximal size. Media will become websites with a combination of text, graphs and video, print will become a very expensive way to publish when paper, printing and distribution cost will increase severely. Also the advertising budgets are moving more and more to digital because digital has two big advantages: 1) advertising target group segmentation and 2) advertising effect analysis. But the major development in media is that media companies looses more and more media consumption time each day. Publishing engines are taking over media consumption times rapidly. This development is called Web 2.0, and it's mainly about user driven content. The media consumer is also becoming the media supplier. Of course a lot of crape is uploaded, but isn't the Internet about being smart in finding what you're searching for?



YouTube, MySpace, FaceBook, Yahoo, Windows Live, Hyves, EBay, dating sites, etc. The user is moving from the outside of the media market to the centre. The user will become the final centre of the media market. Less mainstream is more diversity. More diversity gives better knowledge and developments. Less mainstream is also less central media consumption time and more enhanced local consumption time. It's clear that the Internet makes the global world smaller and the local world bigger.

POSITIVE IMMIGRATION

In PeakOil driven times creating actual/stable brotherhood between bilateral nations will become the main political/governmental/national target. Nations will get bilateral relations that will be based on mutual interest. Not by mutual interest

balanced bilateral relations between nations has no future in times of PeakOil. Each country with assets can choose any attractive bilateral friend they like. There will be positive immigration between all bilateral connected countries. Countries will exchange resources, knowledge and technologies. Bilateral countries will become each other real friends. On mutual interest based real friendships between nations will be the main facet of future geopolitics.

MORE REMIGRATION
Large quantities of the former immigrants will re-immigrate to their more home-lands or other emerging countries. They have proven to be active, duo culture, and RWA (ready, willing and able) to migrate. They blended cultural heritage will be their great asset in a globalized world with strong emphasis of localization, that PeakOil and the Internet has given us. The economic nomads will also be strong and strong in survival, because they know to find the 'fire'.

MORE MIGRATION
Europe will suffer from lack of energy, elements and food and therefore will be an expensive part of the world to live in. Europeans will migrate once again in large numbers to other parts of the world, like the have done till the '70ties. Creation in other countries the same cultural problems as they have had with immigrants in their homelands.

BALANCED BILATERALS
In PeakOil driven times creating brotherhood between nations will become the main political/governmental/national target. Bilateral relations will be based on mutual interest. Not balanced bilateral relations have no future. Politics will complete redrawn from the international stage. Economics will rule. The Western World doesn't have to count on much generosity from the Emerging World. The same way Europe has really doesn't care much for Africa in the past, Africa will doesn't much care for Europe.

LESS SUPERPOWERS
Enhanced localization automatically decreases federal powers severely. The powers become more locally concentrated. Enhanced localization is a result of energy and food transition.

The world become more a by localization 'dominated' place with less federal government and therefore with less superpowers. Example: The chance that the federal government of the USA in the nearby future financially will collapse is severely present. What will happen than? One superpower disappears, 50 independent states with their own characteristics and therefore bilateral relations will enter the world stage.

LESS MILITARY

Unfortunately the end of the Cold War was not the end of militarism. The peace makers (Gorbachev, Reagan and Thatcher) disappeared to quick after the fall of the Berlin Wall and the collapse of the USSR from the international political scene. Unfortunately NATO has not used this unique momentum in time to convert both their systems and those of the Former USSR (FSU) into wise, controlled, mutual descending, creating a more piece driven economy on both former camps. The peacemakers (Gorbachev, Reagan and Thatcher) where unfortunately very soon after the end of the Cold War disappeared from the global political landscape, otherwise the world have look differently today, because those 3 really liked each other and had accomplished things together and that's a good starter for mutual international cooperation. After the USSR was collapsed, the NATO let the former USSR economic collapse in their transition from socialism to capitalism and from a large army driven society to a full consumer production driven society. This was not wise and has given the world new instead of less problems. Russia could present someday the reverse bill of this in times when NATO just doesn't need that. After the Cold War armies has tried to reinvent themselves after the cold war, by being smaller and more high tech. But military as development has come to the end: the new wars are pure economic. Who have the resources have the economic power by this, plus the healthiest economy and the largest ownership to capital? Military means are weak and small sized in effect, compared with issues as cutting of oil, power, fertilizer or capital supply. Military as we know it will disappear, just because really hard economic power means just will out phase them. There is not an objective person with some brains that see that economic power (by means of able to deliver energy, elements and food to the world market) had out phased

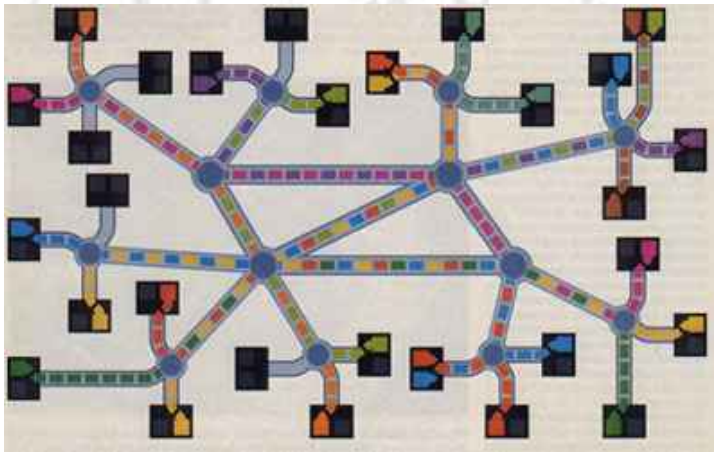
military power in PeakOil driven times. The same way PeakOil has killed the Climate Change movement, PeakOil had also killed the Military Complex.

LESS TERROR

Modern terror has it birth ground in Equatorial Countries. PeakOil will bring these countries to much higher levels of prosperity and will end the US world dominance. Terror has one mother: frustration and two fathers: poverty of the poor and humiliation of the intelligent. Much more prosperity (ends the frustration of the potential poor terrorists and give off-terror pride to potential intelligent terrorists) and a descending global role for the USA (ends the frustration of the intellectual terrorists) will descend the already marginal role that terror plays in our global, regional and local economies and societies.

DIGITAL STANDARDS

The information and communication wave wasn't been possible without global standards for digital communication. Packet switching became the norm. Not more physically connected analog point to point lines with a wavelength on it. Digitalized information (bits: based in 0 and I, as in: no signal or signal), that was breaked down and put together in digital 'packages' and labeled with sender and receiver and posted in a digital transport infrastructure (similar like packages are posted with FedEx or DHL) and on receiver side rebuild to its old status, with request of lost packages if there were. Package switching technologies multiples the network capacities tremendously. The X25 and X400 standards were designed by the ITU (International Telecommunication Union) have been complexly passed by the US born TCP/IP protocol.

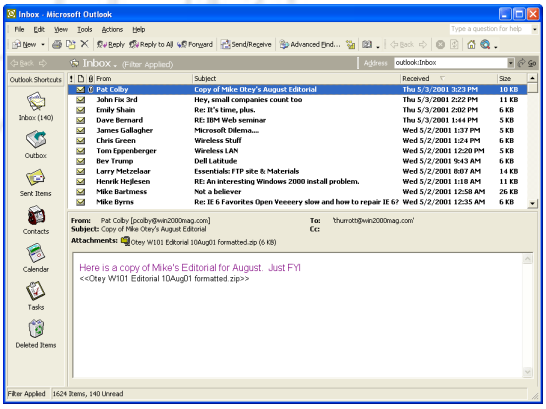


TCP/IP was used to connect local computer networks to each other and has conquered the global digital information and communication transmission, making sharing information and all types of communication much more easier and cheaper and therefore much more applied. TCP/IP has driven each other network protocol of the market. Novell which was the market leader in LAN (Local Area Networks: corporate networks) Operating System software, changed to late and lost its IPX/SPX dominance on LAN to TCP/IP. Also telco's have transite their switching

equipment completely to TCP/IP. The victory of one global digital communication standard has lowered equipment prices severely, made making connections easier, made developing information/communication applications and services much easier. In technology easier and cheaper always results in more and better.

DIGITAL KILLERAPPS

Digital communication had three (so called) killer apps (applications that pushed it roll-out severely): These were email, hypertext based web browsers and index-site's/page's plus search engines. Email was the first application that takes advantage of digital communication. It was a protocol based on several RFC's (Request For Comment) as circulated in the Internet community by the successors of the ICANN like NIC, InterNic and IANA, which results in the definition of the SMTP (Simple Mail Transport Protocol). The ICANN (Internet Corporation for Assigned Names and Numbers) is a not by open democratic rules function the global internet 'government', and is California based private hold corporation, contracted by the US Department of Commerce, making the USA the internet government. This US governmental ownership situation will be certainly changed in the future, as internet grows more and more globally. An example: The slow approval of the .eu domain for Europe was an issue that could be political influenced. An other example: The US now can theoretically cut of nations by removing their toplevel domain record out of the DNS (Domain Name System) root servers by just deleting zone file content or even simple just by marking the .ir root record line with the ; character. Despite there where more email standards and network standards, email could be rolled out and delivered everywhere by the use of gateways between the different (SMTP and X400) protocols, because the email protocol of X400 of ITU was still in deployment (companies like IBM supported it very long). Email was cheap, easy to use, very high speed.



Everybody with a (dial up) connection and an email program could communicate with everybody with a (dial up) connection and an email program. It's not a miracle that email became a success. The @ address format is born in 1971. The World Wide Web as hypertext linked web pages was born in 1989 and developed rapidly after popular the web browsing programs like Gopher, Mosaic, Netscape, MS Internet Explorer and recently FireFox came available. After publishing and accessing information worldwide became very easy, index pages/sites (like the Open Directory project) and search engines (like AltaVista later on followed by the

current players like Yahoo, Google and Baidu -the search engine giant of China-) came into place. From than on the sky was the limit: it became an it selves enforcing development: content gave content consumers and the more consumers there came, the more content was generated. Access to internet based information has boost (and still will) global developments severely. Everything someone wants to know just available at the tips of your fingers. The economic boosting impact of this tool in both human, societal and economic developments have been much underrated. The contribution of the Internet as we know (based in these 3 main killer apps) is an elevator (quick moving to a higher level) phase in human history. Search engines improves mankind's time efficiency enormously and contribute thereby huge to prosperity, something we certainly need in times of PeakOil and attached energy migration, which both have repressing influences on prosperity.

DIGITAL BANDWIDTH

When digital information/communication standards came in place, and digital communication starts to developed, and the above mentioned killer apps (email, web browsers and search engines) came into place connections (first dial up, after that continuous online, first fixed line and there days more and more mobile) where boosting peripheral. These transport demand explosion of course lead to an infra-structural (network to network) explosion based on fiber, which was funded by the dot com bubble from 1995 to 2001 and the growth of numbers of and size in inter-net exchanges. The bubble explode, almost all fiber companies where driven in Chapter 11 or even bankruptcy. But internet use and therefore bandwidth demand keep still growing significant. Peripheral bandwidth still grows and is these days average 5 Mbit/s. Mobile is replacing these days fixed lines a little, but that will be soon grow to higher levels as prices of mobile always online will drop if mobile operators has upgrade their networks to capable of higher bandwidths. Fiber to the business will become more regular, fiber to the curb (street corner) will increase the copper bandwidth of telco's and cable companies. Central infrastructure capa-cities grows also severely, not by digging new lines on existing routes but by putting new end of line and on the line equipment in place. New fiber lightning equipment makes the use of multicolor lasers in one fiber possible, creating an (only equipment limited) bandwidth. On the question 'what is the theoretically capacity of a pair of fibers?' is the only right answer the rhetorical question 'how many colors are there in nature?' Physical unlimited capacity is what fiber has to offer, the current limits are formed by the current (as in: economic available) status of attached equipment.

Fiber networks will be extended more denser in the periphery and more also there will be realized more international routes, but these routes will (for funding reasons) be attached to HVDC based international/intercontinental power infra-structures who will have also build-in optical fibers. This is one of the reasons desert based CSP (Concentrated Solar Power) has a future. Desert states will use the CSP and HVDC combination not only for own renewable power generation and earning export income by power export, but also for connecting their economies and population digitally and redundant to the world. Redundancy is certainly yet an addressable issue in the Emerging World. Cable cuts in the Middle East early 2008 caused off line status for several regions. This is not only a cable issue (physical route), but also a virtual route issue. The BGP4 (Border Ground Protocol) makes it possible to define more routes to the same network (with a cost price based priority). Peering (handling each other traffic for free), transit (handling traffic for payment), BGP4 knowledge (creation of route tables), AS knowledge (proclaiming of Autonomous System characteristics and the routes to them) and IX (Internet Exchange) knowledge can be severely improved in Emerging Countries (like the Middle East) the next years, and give the Emerging World more digital bandwidth and operational redundancy.

DIGITAL COMMUNICATION

Telephone has become digital voice. Email has replaced letters. Newsletters have replaced mailings. Website's had replace printed media. Speed has become default in communication. Low priced the guidelines. Videocalling is the next step that will be made. Certainly as commuting and traveling become more expensive. Video-calling will be one of the killer apps for high bandwidths. The other killer app will be narrowcasting (in most extreme form 1:1). Broadcasting music radio will be replaced by listening to the play list of someone with the choice of music someone likes. Broadcasting television is already in transite to YouTube type of channels. Multicasting will (one sender, several simultaneously receivers) will replace the old broadcasting technologies for high subscribed castings, like news channels and sports channels.

But the tailwind of videocalling will be gigantically. Videocalling will replace traveling enormously: it's cheap, it will be high quality, it takes less time. Videocalling also will replace face to face office meetings severely, as offices becomes less location bounded and each year more and more not location bounded organizational information production, processing, communication structures. Mobile voice calling has become giant (first low volume by old standards, than skyrocking by GSM, and these days more and more by UMTS/CDMA), mobile videocalling will become giant. The new CDMA (the latest improved version of UMTS) technology allows above high resolution videocalling without any live delay. When videocalling will become regular, office based production (and thereby) commuting will enter a severe declining phase. When managers can look their employees remotely in the eyes, the need for commuting to one shared dedicated office location disappears. Office ICT has become already more and more webbased and thereby location independent.

DIGITAL INFORMATION

The quantity, quality, depth, diversity, quality and localization of digital information still grow enormously. This is such boost for human development and economic efficiency. It both facilitates both widens the knowledge of each individual as it deepens the knowledge of specialists. It reduces traveling severely. It reduces the energy cost of information distribution severely. It improves mankind's knowledge severely. It diversifies mankind's knowledge severely. It multiple mankind's knowledge severely. The availability of digital information is a huge tailwind in times of PeakOil. This analysis is an example: also based on by the Internet gathered information and also distributed in many ways on the Internet.

DIGITAL TRADING

Electronic trading resources the energy and also other costs of trading severely. Less shops, less offices, less travel. Information has going digital, communication has gone digital, trade will always follow those two. Capital is the ship that always sails on all information/communication rivers/seas. Digital trading makes products available both cheaper and on more locations. Digital trading is also one of the concepts of cities undermining developments. Trade is one of reason for existing for cities and it goes digitally at high speed.

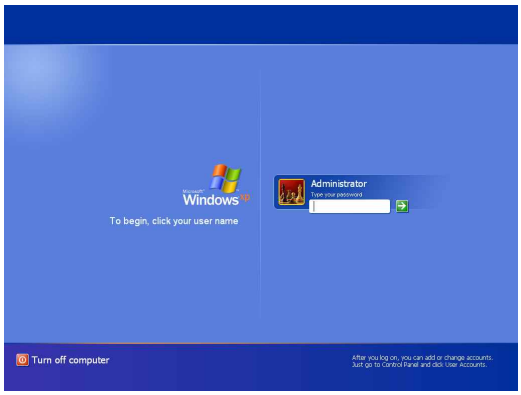
Digitally trade had some sever benefits: Low barriers for both supply and demand, more specification based, more ways of products and services temptation, more cashout efficiency, larger assortments, lower costs, remembering of preferences, extended product information, no closing times, no travel times, free product news feeds, etc, etc. Digitally trade will improved with geo location tools as transport become more expensive. Digital traders will made alliances with similar partners in other areas. Advertising will become more geo location targeted. Geo targeted digitally trade is very cost effective and contributes huge to prosperity levels and by this is a huge tailwind in times of PeakOil. Amazon has filled the gap when other market parties weren't ready. But in 2008 almost any trade and supplier is digital trading ready.

EXTENDED PRODUCT LIFETIME

Consumer driven ecommerce sites like EBay gives a huge volume of products a second lifetime. EBay has ended the disposable culture. Increasing product lifetimes by digital (geo location mentioning) database reselling has become normal behavior for mainstream. The size of this second product life economy is severely underrated by economists. These sites contribute severely to both prosperity levels and to reducing spill levels, both are highly important in times of PeakOil. Used has got its new name: pre-owned.

OPERATING SYSTEMS

The development of powerful OS'es (Operation Systems) has lift computer based efficiency enormously. Before Windows every program must address by its selves the keyboard, the screen, the mouse, the scanner, the printer, etc, etc. After the introduction of Windows program manufacturers could focus themselves on their specific program specific knowledge area and leave basic system functionalities to Windows. This of course made function specific programming a lot more easier. Linux is a same development.



An OS is just a well functioning collection of supporting programs around a core program (often called: the kernel). Programmers that develop based on an OS can leave a lot of work just to the OS. Using programs other programmers has ready already. Using third party building blocks, like building a house and not making own stones, but just used by third party manufactured stones. Using other peoples work over and over again, that's a huge blast in efficiency. Making programming specific functions as 'simple' as doing only that.

DIGITAL PROGRAMS

Certainly there will be new ICT applications to develop, which can take over a lot of human work and hereby increase the productivity (and thereby the prosperity) of nations worldwide, even in times of PeakOil. When prosperity is under pressure, economies need each tailwind they can get, just only for compensation of lower prosperity by increased prices and negative economic growth.

NEW DIGITAL DEVELOPMENTS

The creation of new digital standard/formats has giving new possibilities. PDF (Portable File Format) of Adobe has driven enormously the online/offline publication of leaflets and books. With one simple action they were fully 1:1 digitalized without any changes in the layout and ready for internet distribution. Adobe has always distribute freely their own PDF viewer (Acrobat Reader) in their own website and in third party distributions (like by Google). After search engines also start to index PDF files, the number of PDF files on the world increased even more. PDF has killed the reduced the volume of the printing industry severely. Flash (these days also Adobe) is also a huge technological platform. Flash needs a web browser (like Internet Explorer) plug-in. A browser plug-in is an automatically installation after user approval request by the first time visiting a website with (for the Flash plug-in) Flash content on it. After the plug-in is installed graphically website's becomes accessible and that by high speed. It combines text, graphics and video on web-sites, giving them the possibility to go multimedia. YouTube is an example of a Flash driven site. Flash also makes client/server applications possible: displaying dynamical server data on screens based on user live choices. Ajax is a text based protocol for client/server technology. In email POP3 became IMAP (database driven mail storage), making mail more location independent. Address lists became LDAP. LDAP became ActiveDirectory of Microsoft and its (better) competitor E-Dir of

Novell (former name NDS). Remote Desktop of Microsoft created online desktop environments. Novell NAL (Novell Application Launching) makes application roll-out complete virtual and easy/lowcost. The combination of E-Dir(NDS)/NAL and Remote Desktop makes ICT complete location independent and virtual/manageable against lowest cost. New PC deployment models only use the OS (Operating System), screen, keyboard, CPU and memory of a computer. There are no local settings, everything is feed from server environments. The most simple to roll-out location less office environment is logmein.com: just work on the office desktop as you're there. An offline example or exponent of this development is the USB stick with build-in OS'es like U3.

No more carrying around with notebooks in the future. Just your login (mostly supported by a digital file located key on your USB stick or -very bad development- in RFID in your body). But XML is the hugest development in information communication between computers. XML is the technology to displays parts of several data streams of several servers all around the world in one screen (or put it in an other file). Travel sites with live choices depend almost completely on XML. Book online an airplane ticket and you use XML. But XML goes further. XML offers completely virtual data. Also in the office. The new Word and the new OpenText (open source version of Word) are both completely XML designed. The possibilities of XML in information processes are beyond expectation. Here's a completely new world to discover in efficiency. See everything as a white paper and put there information blocks that can dig/display other information data. XML gives a complete redesign of ICT information architecture. All these new developments has one common characteristic: they facilitate information 'normading', integrated sources, blends, choices into new virtual/actual data for displaying, without any location dependency. All these new digital developments reduce the need for being in a common/dedicated office severely. The make commuting a waste of time. Just work at home: the boss can control by webcam and keyboard logging, or (more effective) by production levels. Or just go to a local shared office building to your reserved or 'just take a free one you like' work desk and visit the office of your company only on special locations. Daily commuting is not cost effective possible in times of PeakOil. These developments are the glue between the (on cheap oil build) pre-PeakOil city focused economy and the (to expensive oil adjusted) post-PeakOil suburb focused economy.

ENERGY AWARENESS
That PeakOil has happened or is bound to happen in the near future is no longer the opinion of a small group of early adapters, but has become (and will become more) the opinion of voluminous main streams in economies. PeakOil has become mainstream in Q3 and Q of 2007. As always: 25% of the energy needed is spend on realization of awareness, 25% on designing solutions, 25% on financing the solutions and 25% on realization of the solutions. Increased or even general PeakOil awareness is a huge tailwind in the process of addressing PeakOil.

DEPENDENCY AWARENESS
Energy deficit nations are becoming more and more aware of their dependency of the good will of other nations. Energy is not something nations can afford not to have. Dependency is weakness. Dependency is hoping for the best to happen. Dependency is about not being the boss in the own house. Dependency is about the possibility that tomorrow the nation's status and future can be severely different. Dependency is for the weak economies, not for strong economies. All governments worldwide therefore will certainly do everything needed to avoid future energy dependency. By diversifying types of energy and suppliers of energy in terms of Carbon. And by absolutely stimulate own soil based renewable energy generation. And by (if desert nations will supply oil or solar energy) maintaining good relations with their governments, economies and inhabitants.

TRADE DEFICIT AWARENESS
Energy deficit nations suffering from strong increasing trade deficits in times of PeakOil. Currently 33% of the trade deficit of the US is caused by energy imports, and as the oil price rises, both this percentage and the total trade deficit rise simultaneously. Trade deficits are bad because is a process of building foreign debts, a process with a limited time frame, somewhere, sometime, they must be paid and more quick than possible. Ukraine is a good example of a state with a huge trade deficit with Russia, which is struggling continuous on the cut off edge of payments.

Globally governments are very aware of the effect of PeakOil on their trade deficits. Oil addiction was not a problem in times of cheap oil, but in times of expensive oil, it's an expensive addiction, that costs a lot of prosperity. The oil part of trade deficits is just subsidizing the producing countries with the prosperity you've worked for. Own renewable energy generation will be equal to stopping exporting wealth or stopping building external debts. Trade deficits have some elastic, but have certainly and end marker somewhere down the line which results in supply cut, which results in economic chaos and heavy pressure on the government that is cut off by its own companies and civilians.

BUDGET DEFICIT AWARENESS

Some governmental debt is not a problem: a nation also has it assets (real estate, roads, shares in companies, etc, etc) that cover these debts. But some nations (and not only the USA) have grown huge governmental debts and gets by Murphy's Law (when the going get tough, the tough gets going) also face in the next years the wave of babyboomers retirements, which reduces the active part of the population (and thereby the economy) and increases governmental expenses by monthly retirement checks.

ENERGY TECHNOLOGY

It's very clear that energy technology will become the other frontrunner in technological development, besides bio technology and glass technology. Silicon Valley her research and venture capital is already switching away from computer technology. Google her two founders are huge VC investors in solar energy and wind energy. Energy technology is just in the beginning of its technological growth. Cheap oil had made energy tech complexly fossil energy focused. The enormous price rise of Hydro Carbons makes energy technology very interesting. The energy budget of the world is huge. There is no better industry to work for, research for and invest in than the energy technology industry. A substantial part of the total GDP of the world is spend on fossil energy. The market for energy technology is beyond human expectation. The huge advantages make currently in energy tech research and in realization of energy tech based production lines for the huge global demand for energy technology are certainly a huge tail wind in times of PeakOil.

BIO TECHNOLOGY

Bio technology will become the other frontrunner in technological development, besides energy technology. Silicon Valley her research and venture capital is already switching away from computer technology. Bio technology has the huge opportunity to feed its own process energy. For energy intensive processes this is in times of PeakOil a huge technological head start. Bio technology is just in the beginning of its technological growth. After the invention of cheese it was several thousand years very quiet on the bio tech. The huge advantages make currently in bio tech research and in realization of bio tech based production lines are certainly a huge tail wind in times of PeakOil. All fossil energy based processes will be redesigned. Bio chemical processes will take over these huge markets in production processes.

Bio chemical technology brings its own process energy. Fossil raw material for industrial processes is not more and not less than just a lot of formerly cheap C and H supply. Bio chemical technology will take the C from agriculture of from the air and the H from agriculture of just from water. Industrial processes based on bio technology brings their own process energy, it will be powered just by the sunlight and its warmth. Bio technology will become the future mainstream production method in all the now fossil C and H supply based production processes. Bio technology also will just out phase some industrial processes. The fertilizers of the future are not made in factories, but just on the soil, but algae's that are spread on the soil before or simultaneously with sowing.

GLASS TECHNOLOGY

As element prices skyrocking, silica and glass (sand based) technologies will become more and more important. Elements and energy scarceness and high prices will lead to substitute material technologies. Just because both production and economic processes that are based on low element/energy prices will face a difficult period in times of PeakOil. Element use has double head wind: rising element source prices and on top of that rising energy prices. This because the purifying process of natural appearance of elements to commercial/use state takes a lot of energy. New glass technology will replace iron and aluminum a lot because the commodities that are used in glass manufacturing are widely (as in: unlimited) available everywhere in the world. The desert states will become the new China of the world: producing al kid of glass products (there is enough sand and cheap CSP energy in the deserts). Glass technology is certainly a major economic development in times of rising element shortages.

FINANCE MODEL

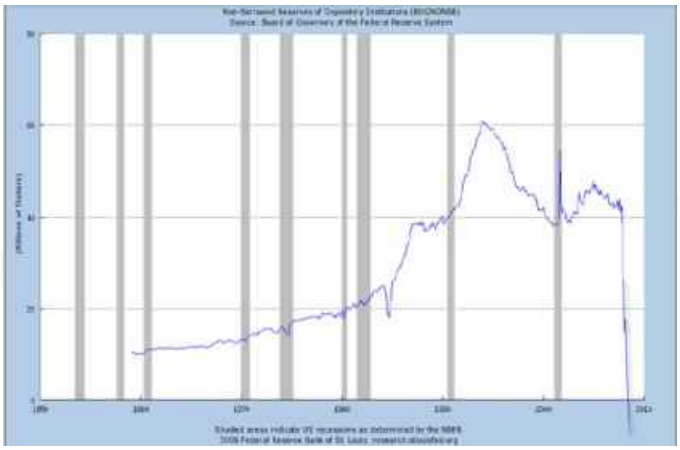
Financial engineering is needed and already done. The Finance Model attached to this analysis will give you information about a global model for instant huge energy investments (both large central, as massive decentral) in large numbers worldwide for the total amount of one year world GDP.

In a model that is realizable in a severe by subprime caused down writing hit financial market. It's based on a combination of backwards guarantees, forwards guarantees, specification focused fixed amount tendering and performance bonds, all covered with governmental and commercial insurances. Making Action Plans is one thing: Knowing how to address it and stimulate the needed changes. Knowing how to finance the investments needed for these changes is an other thing. This analysis has a Finance Model attached. Use it to make your Finance Plan for the transition of your economy, government, company and household. The attached Finance Model is suitable, even in times of a wounded financial world by the American Credit Bubble Crisis. The Finance Model is based on both backwards and forwards guarantees, backed up by commercial and governmental guarantees. It's the only model is suitable of facilitating the huge capital demand needed for global transition away from Expensive Carbons. The attached Finance Model has two main benefits: 1) facilitating the finance of huge central energy investments for each economy worldwide and 2) by financial engineering attached to those huge central investments also creating a national equity fund of the same huge size as the huge central investments for making financing massive decentral investments possible.

SITUATION | HEADWINDS

INTRODUCTION
Like the resources situation causes us not enough headwind trouble, we got to deal simultaneously with some other headwinds. They are also very heavy headwinds for the global economy and just these factors should play an important role in solutions regarding the resources situation. Hereby the one headwind enforces the other and visa versa.

CREDIT CRISIS II
The current credit crisis is the second one that hits the global economy. The first one was in the early '80ties, when banks also has thrown capital (much less than now, even after inflation correction) to bad debtors, who paid interest as long they could do that by obtaining new credit lines. The Tier One Capital (own capital reserves) of many banks have become negative. This happed one time earlier in the early '80ties due to payment problems of the developing countries, only this time the amounts are much and much more higher. See FED made data image below. One picture tells more than 1000 words ever can.



In the US the FED these days borrows 'reserves' to banks, so that they still 'fit' in the global banking regulations known as Basel One. Nobody knows the real damage of the subprime crisis yet. Banks are well know in hiding losses in the pipeline till better times give better possibilities to write downs. This has happened once again in the early '80ties, when all global banks are confronted with huge write down of the capital they had lent to emerging markets, capital they had lend from the first wealth of the oil nations. Only this time the amounts are much and much more higher. The economy of the US is feed by 15 years of huge capital imports, money that had to be invested. The US economy is not 50% (equal balanced between consumption and production) but 70% based on consumer spending, based on two big issues: increasing house prices and the huge request for dollars. The housing bubble has exploded, that house prices could not rise for ever (and that a financial system based on that has a limited lifetime) was clear to some banks (Goldman Sachs for example) but not for others, the banks that understand the market,

package the top part (the top 30% from 70 to 100%) in CDO's and sell this risks to not so cleaver/bright financials with no/less basic economic system understanding (like the fact that capital had value and must be earned), often covered by even more dumber Triple AAA insurancers (mostly called monolines). Much house owners could not pay the adjusted interest rates (after the 1 or 2 year discount rate). This has lead to a foreclosure wave and a foreclosure wave has first stopped the rise of house prices (and stopping the over consumption part of the US economy that was build on it) and than has started a free fall, causing five problems: 1) drying up bank liquidities that are feed by mortgage payments 2) causing banks and financials to major (never seen before in size) write downs 3) shrinking under laying assets and by the value of these securities and by this bank's own capital positions 4) this makes capital acquiring by banks more difficult 5) the insurancers face claims of the insurances they have provide to the CDO buyers, and the insurancers could never pay out this by as snow in the sun disappearing CDO pledge value collapsing damage, so banks don't force them to Chapter 11 or bankruptcy because this will lead certainly to a zero value of the COD insurance and than the lost must be published in the books 6) and if (Triple) AAA insurances actually become worthless, than it not effects the subprime CDO values, but all the bonds that are issued by these insurancers can be valued as worthless 7) this results giant falls in secured capital exposure for bank, placing severe parts of their balances from (Triple) AAA covered to not insured 8) this once again hits their balance positions in terms of Tier One volume against risk exposure 9) acquiring capital become even more severe by this domino like serial effects 10) the financials that are to deep in CDO capital melt down, 11) this capital melt down maybe even can doubled by Credit Default Swaps (CDS) problems when economies start to cool down and some companies come in bad whether. A CDS crisis will also lead to a new attack on /drain off insurancers capital/ratings, with the above mentioned indirect capital effects of that for the banks. In all these conditions, banks which had already low Tier One capital ratings, or has other headwinds (like Societé General with the Kerviel case), or a combination of these will certainly need new Tier One Capital. This will new capital will come from the only true sources that are available: the Governmental Wealth Funds of both Carbon Rich Nations and Emerging Nations, who really like to convert their dollar stocks into dollar assets and are strong enough to play hard ball. Two years ago there was legislation in process against this development, today everybody is happy by this available only way out.

Therefore almost every financial keeps as much as possible in the pipeline, hoping (against better knowledge) that the US house market will recover, but everybody knows by heart that market top levels are top levels and not average levels. By the fact that the US economy heavily was feed by cashing each year risen house prices feed mortgages increasing and not by real economic production, there are new problems coming. When capital become scarce, people can spend less, this lead to less economic activities (certainly in a nation where 70% of the economy was about consumer spending), which lead to less jobs and so on till this negative development stops on a level of actual real economy. But that's not all. All issued consumer credit lines will be effected by the subprime disease. Many people with less capital to spend will first delaying payments and later on maybe even stop paying creditcard debts (causing a new, a little smaller, but also huge subprime crisis). Many people with less capital to spend will first delaying payments and later on maybe even stop paying car finance debts (causing a new, a little smaller, but also huge subprime crisis) and this will hit the mobility (car) industry severely, causing a new lower real economic bottom the market. And the same can be said for general consumer credit. Many people with less capital to spend will first delaying payments and later on maybe even stop paying their general consumption credit debts (causing a new, a little smaller, but also huge subprime crisis). After all this on fictive based consumption is drawing out of the market and everybody has taken their losses, the US economy will again getting strong, because it's a very vibrant economy with a history of getting strong again events, the US business are strong despite the heavy headwinds the US will face the next years. But unfortunately for the world, 1) the US is the leading economy and 2) every financial worldwide has financed the US house bubble and will face major write downs.

The US housing bubble and all its side effects will hit all financials of the world severely. It will undermine the financial sector enormously. It will damage the trust the world has in the US, financially and economicly, trust is something the US needs a lot, otherwise the needed excessive governmental budget funding can dry up. But the credit crisis has an other huge effect: PeakOil asks for huge (1 or 2 times total global/world GDP, often called GWP) investments in a very short time. The financials that have been damaged will have less volume capacity. First: the huge central investments needed by addressing Carbon Depletion: Maybe the conclusion is right that the finance of the gigantic in number volume huge central

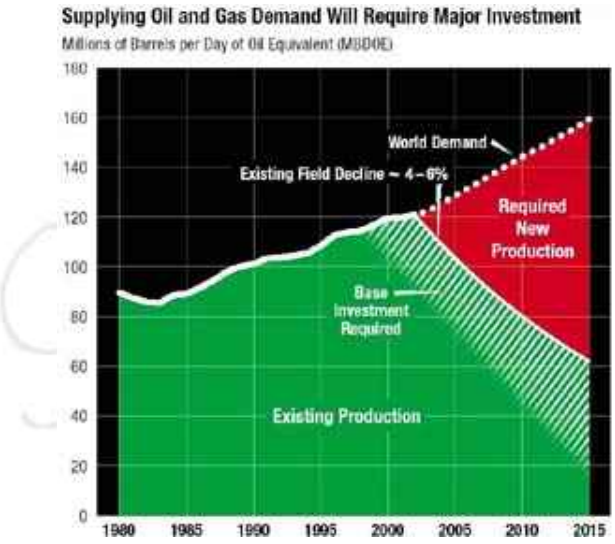
investments of $ 0.1 billion ($ 1.000.000.000) till $ 10 billion ($ 10.000.000.000) will not be done by banks, the certainly will have no power for these types of investments. But when the collaterals and third party securities are not good, but splendid, the central banks (FED, ECB, etc) maybe will provide these huge needed capital streams under guarantee of these splendid collaterals and third party securities. Second: The massive non carbon install base investments. If general transition focused not starts very soon, (and match with economic lifetime of products) the increased write down speed on carbon fueled installbase will cause a next subprime wave, but than not only US based, but globally, ever not at time with transition of the installbase started economy.

INSTALL BASE

Our current mobility, transport, building heating and warm water installbase is almost complete fossil fuel based. This is a major headwind. All economies face a major increased write down lost on these complete installbases. What's the use of a gasoline fueled car when gasoline has become too expensive to power a car? Increased write downs on installbases burdens the already by PeakOil hit economies once again severely. Renewing/adjusting the installbase to electrical or hydrogen power is just an extra cost, a needed investment wave that only burdens the economies and give no economic growth in return. Changing installbase is negative economic growth and inflation without any new functional benefit or prosperity/wealth facet in return.

BUSINESS MODELS

The complete on Cheap Oil based economic, societal, governmental, corporate, private models of function are out dated in times of Expensive Oil. Expensive energy demands other models. The problem is that other models means changes and people, companies and governments don't like changes very much. The reason for this is simple: Changes means reshuffling, reshuffling means position risk. But the on Cheap Energy based models are worthless (even negative) in completely opposite changed times of Expensive Energy. Losing old models is losing a burden. But losing old models will be not easy. The good old models of the past are certainly a head wind in severely changing times of PeakOil. An example: We're use to go from the suburb to the city to work. That's what we are. That's what we know. We hate traffic congestion and we love it the same time, because it is a part of our current live. What if we gone work remotely from home or from a remote office in our home town. We see what we lose, we don't yet what we win. But when commuting will really eat out of our income, we will be please to say commuting goodbye. And yes, we go once in a week to the main office in the city and enjoy the cosmopolitan atmosphere. And yes we're gone love our new (bigger) houses: the company pays a piece of the mortgage in exchange for the use of the home office room by yourself.



One of most expressive examples of old business models is Big Oil. Earning due to the high oil prices more than ever, but more and more being cut off of the sources and management that decides to invest the profit in purchasing own stock. That any shareholder accepts this is a miracle on its own. Even that there aren't yet activistic temporarily conglomerates of shareholders. Big Oil their business models are focused on big oil. They are disabled by their own being. But historical and actual. And it's all between their ears, what keeps them today prisonized of their history. Their views are historical one sided. Oil is good. Not oil is bad. And when oil gets better (Q4 2007 profits where higher than ever), they don't see that not oil gets better, but that energy gets better. And that in the energy sector, oil headed in the wrong direction (in terms of price/energy) and renewable is heading in the right direction (in terms of price/energy). In most cases leaving old business

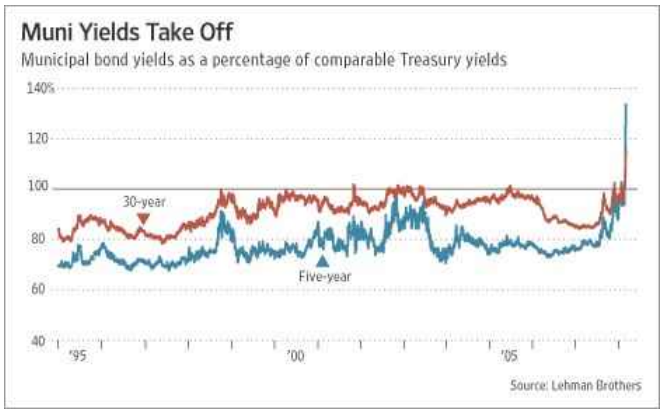
models needs new leadership. A better solution should be dual policy. Than old models and new models can compete on the same markets, powered by the same corporate infrastructures and governance.

TRADE DEFICITS

Nations with a huge trade deficit could face a head wind by the enormous investment wave that energy transition will cause. It could double their trade deficit in short time, because during transition there are still the fossil energy import (transition is realized, not functioning), and there is this new transition investment wave. Transition investments will be purchased in nations that are more far in transition processes. By the fact that the US has oil addiction in the genes of their economy, there are two possible scenarios for the US. Or their addition will force them in a secondary/background position concerning transition technology (the out of scope model). Or their addition has given them only a slow start, but an accelerating performance. The energy transition could burden or easy the trade deficits. Governments that proclaim PeakOil (like Sweden and Israel have done by setting a timeline for a fossil energy economy) will protect their economies from extra increasing trade deficits, because their economies will grow a transition industry and by this they will import less transition technology and (equal importance) b the head start of their transition industry, they will get a lot of foreign orders that ease the increase of the trade deficit due to fossil energy imports.

BUDGET DEFICITS

Governments that have already huge debts and face more spending and less income by declining economies due to PeakOil will have severe problems by financing their transition and will hereby stay buried under rising energy costs. Even by high interest rates (15-20%) there is no capital supply for US Municipal Bonds (semi-governmental capital investments), which will leads to yet higher interest rates. Municipals have overgrown treasuries enormously in interest rates. This is a very strange development, because Municipals represents actual value and Treasuries are more and more just fuel for paying interest on earlier loans. If the federal government survives their debts is a question: States could choose to let the federal ship debt burdened sink. Municipals their actual forecasts are better then those of Treasuries. Yet Treasuries are still covered by some (economic fake, yet official) roof.



Most of these less capital supply is due to the fact that there are no Triple A bond insurers left that is RWA (read, willing and able) to guarantee repayment. Due to the absence (of also been proven fake roof of the Bond Insurancers of the past) interest rates skyrocking, even as these huge interests are tax free income for US citizens and (investment) companies: making the cost of the loans even more expensive for the government.

WEAKENING CURRENCIES

Certainly weak currencies are a major headwind in transition processes. Companies in sliding currencies will not get easily governmental export guarantees for huge deals that can be made in times of economic transitions. Of course everybody wants to get debts in sliding currencies: the debt will pay itself by the sliding. But project performance in a sliding currency is a huge risk, which certainly not will be commercially insured by any wise insurance company.

Companies in countries with weakening currencies will certainly export a lot of complete products (by their by the weak currency cheap price), but will not being able to perform as contractor for huge transition investment projects because the purchase power of their currency is a threat for the project delivery.

FREEDOM RESTRICTIONS

In times of headwind, the only thing we have really to change things is our intellect. Headwinds stimulate our intellect enormously in finding solutions. Governments that still believe that terror is the greatest threat to their nation, haven't read the newspapers the last years. PeakOil is the ultimate threat to our way of living. Governments that still working on issues as Martial Law certainly break there own windows. Martial Law doesn't attract the free clear minds needed for finding, designing and realize solutions. Martial Law is a last act of a PeakOil ignoring government, turning them into a non democratic regime. Martial Law is the end of an open society. Martial Law kills creativity. Martial Law drives the Western World back in to the Dark Ages. Each government that wants to find solutions must stop any Martial Law preparation and openly declare their believe in an open society. This will pay off in accelerating out-of-the-problems progress instead of reactionary escalating situations. The history of Europe tells very clear that free societies has giving and attract the smartest brains. All non constitutional governmental activities must be stopped. Governments must openly renew their loyalty to and defending of the Constitution, the Geneva Convention and the right of privacy. Only freedom has beautiful children. Freedom restrictions are a huge headwind in times of PeakOil. They frustrate the ambiance of finding and realizing solutions.

OFFENSIVE POLITICS

In times of PeakOil is the main value we've got good bilaterals and good multilateral. The US really has a problem in this. Invading Afghanistan and Iraq and bully talk to Iran and Venezuela was not a wise thing to do. Unnecessary also. China hasn't send one soldier around the global, but the confiscating almost all the natural resources of Africa, just by friendship and co-development. China had signed the contracts to explore the Iran natural gas reserves. Cutting the US completely out of both Iran and there natural gas resources. Venezuela openly dislikes the US. The US has fights with their neighbors. In Cuba territorial waters are oil reserves. But the US has no change to buy it ever. Chavez of Venezuela organized in February 2008 in Argentina a South American / Middle East conferencing of governmental leaders of both global regions. Offensive politics are contra productive. They cost a lot of money, drain economies and only give higher oil prices and more geopolitical tensions. The US needs a governmental attitude that sizes their natural resources. Bully's have less friends in time of choices. Offence politics also cut off the offensive nations of energy supply if the granting distribution comes on top of the price mechanism. Offence politics is a headwind in times of PeakOil and nations like China just benefit of the offensive politics of other nations. In times of PeakOil is better to have real friend. Real friendship is not made by rifles, bombs and tanks, but by banks, by mutual interests.

DAMAGED BILATERALS

Relations between nations are just like human relations on micro level. There are intensive periods, there are silence periods, there are good times and there are hard times and there are people that don't have contact any contact for a long time or even never, even when to pass each other daily. Bilaterals can grow, bloom and turn into severe hard times of opposite interests. Bilaterals are certainly be damaged by debts. This is a danger for the largest economy of the world, because it behavior on the area of debts can severely threaten all her bilateral relations. The

world is not very pleased by the US subprime crisis. Although they have bought the CDO by their selves and are responsible for their own risk management. Financials (and thereby countries) aren't pleased by the write downs caused by the subprime crisis. A financial crisis that more and more is seen as a result of a more structural problem: the polarity change from the US away from bank of the world to debtor of the world. An overall over stretchiness in credit use of federal state, all 50 states, all municipals, many companies and almost civilians. All spending far beyond real economic production by the easy accessibility of credit for the whole nation. The world is on the edge of cutting off the USA economy of credit. The US economy has been for years boosted by continue rising house prices. These prices were severely overrated and these over rated value will flows out of the system after the over-valuation is stretched to the max. When 70% of an economy is about consumer spending, nobody can tell how vital US companies really are without the capital fueling of rising house prices, that's something the future will tell is. The former "profits' of banks are quoted already and being leveled by current losses. Maybe this also will also will apply for recent historical economic 'grow' figures.

Building up debts and let other nations pay for it is not national economic growth, but both national and global damage. If the US federal government goes bankrupted, the USA a lot of current friendly bilateral will chill severely. Dollar positions worldwide are being diversified to baskets of currencies and baskets of currencies and commodities. An other issue is imago damage. Let's for this also look to the moral leader of the world. Internationally: A huge number of Iraqis have been killed and in Guantanamo Bay is not any international law applicable. Nationally: Civil rights of 300.000.000 US people are been withdraw severely, Martial Law is designed, for the one accident of terror that could happen by multiple governmental screw up before and on that day. Financially: The financially behavior of the US threaten both the future of their children and global stability. Damaged bilaterals are certainly a headwind in times of PeakOil.

INTRODUCTION

Is PeakOil threatening everything we've build the last 50 years? Yes and No. Yes as we embrace the past, no if we embrace the future. There are headwinds, there are tailwinds. But the combination of human freedom and intellect will give birth to the needed solutions for PeakOil. Will there be problems? Yes, we were and still are not ready for PeakOil, so yes, it will hurt our economies and thereby our governments and our lives. But everyday we start earlier the impact will be less. Solutions are in increased efficiency, new technologies, models changes and enhanced localization. Making a world that is characterized by détente and international cooperation and is able giving all the possibilities for a good life for everyone. The creation of a global economy that can support sustainable a world with 9 billion people in making a good live is certainly realizable. And yes it can be done in the next 10 years, despites all the headwinds. We're people, we're smart and inventive, as soon as we see the problem clearly. The year 2008 will become a turning point in modern global history.

WAKE UP

Nations that will put (like an ostrich) their governmental/economic/societal head in the ground for the coming PeakOil related developments will be hit severely. Economic, societal and governmental. Just because cheap oil is what the build on, and it that foundation is taken away, their model collapse.

Doom scenario's only will become reality as nations not anticipate on PeakOil related issues, if they anticipate, and they to this on time (as in: now) the doom scenario's will pass the nation certainly, only causing some minor problems. When they anticipate (and they do this not too late) they will get stronger, sustainable and with more prosperity and more well-being trough and after PeakOil. In the other hand: The effect of not waking up is economic, societal and governmental

dire straits. The premium for waking up is giant. Waking up really pays off. The price of staying asleep is beyond exceptions.

STORM AHEAD

PeakOil will end the Cheap Carbon based economic model. It will destroy totally the Cheap Carbon type of economies. Economies that depend on huge quantities of cheap energy gets certainly into dire straits (as in: negative economic growth as best possible scenario). PeakOil is the end of economy and society as we know it. PeakOil is also the end of more and more up scaling and more and more ivory towered, more and more inbreeded government as we know it. Local will become the norm. Federal must earn again (like in the early days of government) the right of existence. Economies, societies and governments will become more diverse. People and companies will go to the areas where economy (equals to life) and government has the characteristics the need of desires. The economy of Germany after World War I was ruined by the Versailles Treaty payments. Each economy on the world that doesn't transite away from accelerating becoming more Expensive Oil will be ruined by the trade deficits and inflation this will bring them. Going into PeakOil is going into economic, corporate, governmental, societal, household and personal hell.

FASTEN SEATBELTS

As result of the fact that people, economies and governments only will change if they're forced by it by the market mechanism of supply and demand, transition will start certainly everywhere to late (even starting yesterday was already to late). By this economies and therefore governments (and by the combination of those two: people) will face severely turbulence in existence.

Prices will rise skyrocking, economic growth will stop, economic negative growth will take its (not easy to burden) price of unemployment, economic decline will go on this it hits its new bottom. The intensity of the economic and governmental turbulence will be determined by the moment of starting transition and the intensity that is done with.

CHANGE DIRECTIONS

PeakOil will end the Cheap Carbon based economic model. Just as planes avoid turbulence weather conditions by changing directions economies can avoid the PeakOil Chaos. PeakOil is the not be place for economies and governments and their consumers/civilians. Changing directions is as easy as facing the problem. Proclaiming the problem is what the job does. After a problem is mentioned only stupid people, economies and governments don't change directions and crash full power fronted in the disaster. Changing directions is as easy as knowing what lies ahead of us if we don't change. Changing directions demand positive leadership, not totalitarian command. Companies and people must do it. Governments can't do it. But they certainly can steer in the right direction away from PeakOil.

DON'T WAIT

Time is not on our side in transition away from a Cheap Carbon fuelled economy. We're already too late. Governments has failed in their steering responsibility the last years, by being completely obsessed by terror (minor problem), by fake economic growth (must be based on real values) and by military actions (destroyed a lot in times of PeakOil needed goodwill by other governments and nations). Math can show the economic damage of waiting. Time that passes by, deepens the PeakOil caused economic damage.

Below a replay of some text from the first pages of this analysis that will tells the importance of not waiting any longer with transition: "There can be made some interesting diagrams that make the effects of start date of transition very clear. The start date is the wildcard that can maintain or destroy prosperity. There can be made a simple mathematically model between the next two variables: level of fossil energy prices, the time period and with as result the cost of transition. Also there could be made a simple mathematically model between the next two variables: start date transition, energy price with as result: possible height of transition level (is maintaining prosperity). There can be made a simple mathematically model between the next two variables: start date transition, energy price with as result two lines: economic collapse and societal collapse (societal collapse always comes later than economic collapse, the same as economic collapse comes later than the actual developments that cause them (one of our huge but short time benefits we now can use)." Waiting is contra productive. Waiting on what? The facts are clear. We're already too late. Let's start today and not some time in the future. If you're a

leader: be one. It's needed now, otherwise our own future (and not only the future of our children and grandchildren) is at the line.

EMBRACE TECHNOLOGY

The number of people on earth we don't want restrict: we love life and freedom of own choices. The demand for prosperity we don't want to restrict: we love prosperity and the good life. The major wild card we have is technology. Technology will give any number of people on the earth (a number that will stabilize automatically) a good life in health and prosperity. And of course technology is embedded in production processes and organization models and funded by capital.

EMBRACE INDEPENDENCY

In a world with less dependency there are less tensions. This is not an old plea for isolationism in a new jacket. An open, not isolated world, with free traffic of goods and persons is a good world, with less governmental spills of prosperity. But why being dependent, when you could be independent without isolation and without prosperity lost. See more independency in the basics (energy, water and food) for economies, companies, household and individuals as insurance of prosperity.

EMBRACE FREEDOM

Both new technological and new organizational developments only find birth and growth in societies where freedom of thinking and communicating is sacred. The recent history of mankind has showed this very clear. Strong states, disdaining of the confidentiality of (e)mail, the crime of registration of internet behavior of individuals, the crime of registration of travel by public transportation chip cards and road pricing of both companies and individuals, phone and internet tapping, identification demands, personal ID chip cards and the ultimate RFID chip represses the human freedom environment and thereby the human ambiance of invention. Totalitarian states have not been economic successful any time in human history. They're inefficient but (more worse) they kill the air of innovation that freedom certainly is. The world needs new solutions. Not reactionary old stuff.

EMBRACE LOCAL

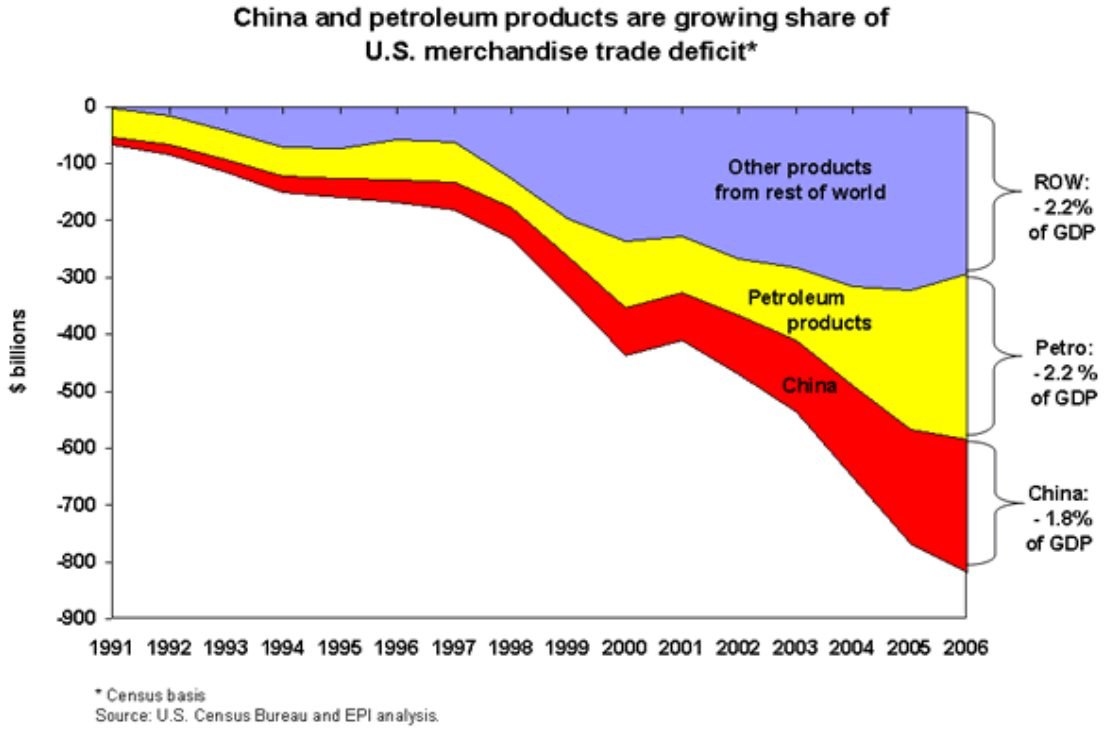
PeakOil just terminates the old cheap fossil energy, elements, materials and food characteristic period of Cheap Carbons. Enhanced Local is what Post Carbon is all about. Build diverse, high function level, enhanced local economies. Bring in the fiber. Make videocalling possible. Enjoy the extra hour in the morning by stopping with commuting.

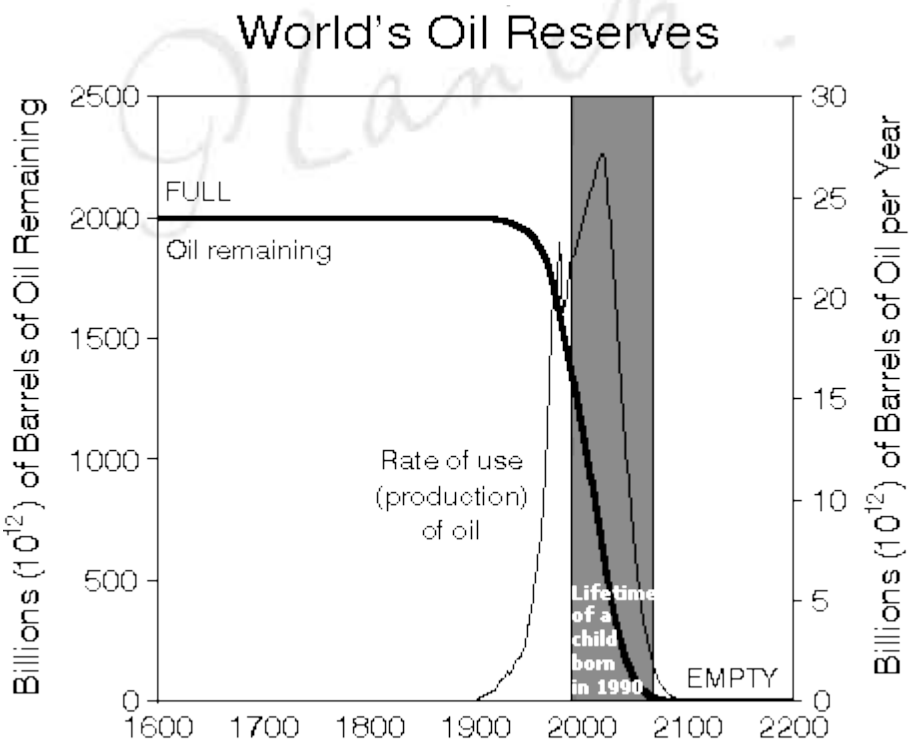
Enjoy getting home one hour earlier and being less tiered by not commuting. Design local food production capabilities. Enjoy art and music, both locally and from the Internet. Uses your brains for your job. Enjoy bicycling and nature. Enjoy sports and dancing. Enjoy people and relations. And of course most of all: enjoy your kids. Vitalize local societies. We're not getting backwards, we're heading forwards. Create a PostCarbon society where it's very good to live in. Stay where you are. Dig in. Make a good local life with a wide cosmopolitan flavor.

FULL POWER AGAIN

Don't be paralyzed. Just be a human: intelligent, flexible, innovative, and motivated. Be what you've always been. PeakOil is the chance of bringing the best of you more to the surface. Live is beautiful. Enjoy it. Also/certainly in PeakOil and PostCarbon.

Amsterdam, January 6, 2009 Gijs B. Graafland.





ACTION MODEL

ACTION MODEL | INDEX

- INTRODUCTION
- QUICK
- SMART
- VOLUMINOUS
- GUARANTEES
- MACRO CSP
- MACRO WIND
- MACRO OCEAN THERMAL
- MACRO LAND THERMAL
- HVDC NETWORKS

MASSIVE PERIPHERAL INVESTMENTS
- INTRODUCTION
- FUTURE SECURITY
- MICRO SOLAR
- MICRO WIND
- MICRO WATER
- MICRO THERMAL
- MICRO CONSERVATION
- MICRO MANAGEMENT
- MICRO DC
- MICRO STORAGE
- MICRO FOOD
- FINANCIALS
- GOVERNMENTS
- GRIDS

CHANGING INSTALLBASE
- INTRODUCTION
- WRITE DOWNS
- ECONOMIC MOVEMENT
- MURPHY'S LAW
- BUBBLE CORRECTION
- HUGE CAPITAL DEMAND

CHANGING PROCESSES
- INTRODUCTION
- LOW ENERGY
- LOW TRANSPORT
- LOW ELEMENTS
- BIO CHEMICAL
- ENHANCED LOCAL

GOVERNMENTS
- INTRODUCTION
- PROCLAIMING
- INFORMATION
- TARGETS
- SUBSIDIES
- LEGISLATION

DEVELOPMENT NETWORKS
RELIGIOUS NETWORKS
IMMIGRANTS NETWORKS
EXPATS NETWORKS
UNION NETWORKS
ENTREPRENEURS NETWORKS
KNOWLEDGE NETWORKS
CAPITAL NETWORKS
CORPORATE NETWORKS
EXPORT NETWORKS

FINANCE MODEL

FINANCE MODEL | INDEX

SUMMARY

SERVICES
- PROCLAIMING
- INFORMATION
- DEMONSTRATION
- INITIATIVE
- FACILITY KNOWLEDGE
- FINANCING KNOWLEDGE
- HANDLING
- SPEED
- BEST VALUE FOR MONEY
- BEST DESIRED SPECIFICATIONS
- INVESTMENT FUNDING
- CASHFLOW GUARANTEES
- TENDERING HANDLING/GUARANTEES
- INSURANCE HANDLING/GUARANTEES
- ROUND CHAIN
- BRIDELESS MODEL
- GOVERNMENTAL PERMITS

MARKETING
- NAME WEO
- PARTNERS
- BOARD OF ADVISORS
- INTERNATIONAL ORGANIZATIONS
- INITIAL GOVERNMENTAL ORDERS
- MODEL EXPLAINING WEBSITE
- WSJ PAGE AD AS KICKOFF
- FREE PAGE AD PROGRAM
- FREE BANNER PROGRAM
- MEDIA EXPOSURE PROGRAM
- YOUTUBE/HYVES/FACEBOOK
- REQUESTS GATHERING DATATECH
- UPDATE COMMUNICATION EMAIL/RSS
- GLOBAL DIGITAL ENERGY SUMMIT
- GLOBAL NETWORKING BY IMMIGRANTS
- EMBASSIES AND CONSULATES

ORDERS

- GOVERNMENTS
  - LOCAL
  - REGIONAL
  - NATIONAL
  - BILATERAL
  - MULTILATERAL
  - SUPRA NATIONAL

- OPERATORS
  - POWER COMPANIES
  - WATER COMPANIES
  - TELCO COMPANIES
  - GRID COMPANIES
  - OIL COMPANIES
  - FINANCIAL COMPANIES
- CORPORATIONS
  - ALUMINUM
  - TRANSPORT
  - BANKS
  - LEASERS
  - FOOD

FINANCING

- INVESTMENT GUARANTEES
  - PLEDGE GUARANTEES
  - PARENTAL GUARANTEES
  - NATIONAL GUARANTEES
  - PRIMARY BOND BY RE-INSURANCE
  - SECONDARY BOND BY RE-INSURANCE
- CASHFLOW GUARANTEES
  - ENERGY COMPANIES
  - OIL COMPANIES
  - GRID COMPANIES
  - SUPRA NATIONAL GOVERNMENTS
  - NATIONAL GOVERNMENTS
  - REGIONAL GOVERNMENTS
  - LOCAL GOVERNMENTS
  - LARGE INDUSTRIES
  - LISTINGS ON POWER EXCHANGES
  - PRIMARY BOND BY RE-INSURANCE
  - SECONDARY BOND BY RE-INSURANCE
- REALIZATION GUARANTEES
  - TENDERING PUBLICATION
    - PUBLISHED ON THE WEBSITE
    - NEWSFEED TO SUBSCRIBERS
    - MEDIA EXPOSURE
    - PAGE AD SUPPORT
  - TENDERING MODEL
    - FIXED PRICE TENDERING
    - SPECIFICATION BASED TENDERING

NEWEST TECHNOLOGIES
MAXIMAL OPERATIONAL RESULTS
INNOVATION BOOST
BRIBELESS SYSTEM

TENDERING FACETS
DESIRED SPECIFICATIONS ANALYSIS
LOWEST MAINTENANCE COST
MAXIMAL SPINOFF EFFECTS
BEST ENVIRONMENTAL VALUES
QUICKEST REALIZATION

PERFORMANCE BONDS
PRIMARY BOND BY CONTRACTOR PARENT GUARANTEE
SECONDARY BOND BY CONTR. GOV. EXPORT AUTHORITIES
TERTIARY BOND BY RE-INSURANCE PRIMARY
QUATERNARY BOND BY RE-INSURANCE SECONDARY

CONTRACTS SALES

BENEFITS
CREATING UNLIMITED IN VOLUME FACET
PULLING FURTHER PROFITS TO THE PRESENT
EQUITY CREATION FOR TRANSITION FUNDS

SYSTEM
PUBLISHING ON THE WEBSITE

WHOLE CONTRACTS
PENSION FUNDS
MUTUAL FUNDS
SOVEREIGN WEALTH FUNDS
INSTITUTIONAL INVESTORS
INSURANCE COMPANIES
INVESTMENT BANKS
HEDGE FUNDS
PRIVATE EQUITY FUNDS
VENTURE CAPITAL FUNDS
PUBLIC TENDERING

FRAGMENTAL CONTRACTS
NYMEX GREEN EXCHANGE
STOCK EXCHANGES IPO'S
PUBLIC TENDERING
OWN EXCHANGE

FUNDS
ORIGIN
CONTRACT SALES

GOVERNMENTAL GUARANTEES
FEDERAL RESERVES
PENSION FUNDS
SOVEREIGN WEALTH FUNDS
CAPITAL MARKET SURPLUS
SAVING PLANS (PUT YOUR MONEY WHERE YOUR FUTURE IS)

FOCUS
GEOGRAPHICAL ORIGIN FOCUSED
MICRO DEVELOPMENT/TRANSITION FOCUSED
EQUITY AS RISK CAPITAL (LOW RATED CAPITAL PURCHASE)
INTERNET BASED ENGINE (LOW COSTS)
RAIFFEISEN ACADEMY (COOPERATIVE BANK UNIVERSITY)

MODEL
SAVING MODEL (TARGETED WITHIN)
SECURITY MODEL (INDIRECT EQUITY)

EXCHANGES

PURPOSE
HUGE MARKET DEMANDS
FACILITIES MUST BE DESIGNED
FACILITIES MUST BE PRODUCED
FACILITIES MUST BE INSTALLED
FACILITIES MUST BE MAINTAINED
EQUITY IS NEEDED

FUNDS
CORPORATE
ENERGY

COMPANIES
SHARES TECHNOLOGY
SHARES INSTALLERS
SHARES OPERATORS
SHARES IP RIGHTS

ENERGY
DELIVERY OUTPUT OWNERSHIPS
DELIVERY FORECAST OWNERSHIPS

IP RIGHTS
PURCHASE
EXPLOITATION

SUBSIDIES

STRUCTURAL EFFECT
EFFECT RELATED

FURTHER
WATER
FOOD
HOUSING
TELECOM

CONCLUSION
ROUND MODEL
GAPLESS DESIGN
COMPLETE SUITABLE
INSTANT APPLICABLE

NOTES