GLOBAL ENERGY TRANSITION PLAN **(Final)**

Paper to ASPO 7 Conference, 2008

Andrew McKillop

Global Sustainability Options consultant, IMH Associates, London & Beirut.

Blind Faith in The Market

Despite there being no 'supply side solutions' able to replace or substitute current rates of world oil and gas demand, and cover coming physical supply shortages, near-term for oil and probable by 2010-11 for Eurasian pipeline gas, this fact is apparently contradicted by oil market operators. A myriad of players in the 'paper oil' market, from the now mostly bankrupt or part-nationalized big private banks eg. Lehman Bros, Goldman Sachs, Merrill Lynch, to the smaller players notably including the hedge funds, can each day 'talk down' and 'talk up' oil prices.

Apart from providing large trading profits on unstable, volatile prices, and the values of related and derived assets, such as CDOs (commodity linked debt instruments) this market-based control of about 51 mln barrels/day (Mbd) of world traded oil supply is perceived as reassuring by the media and public opinion. The key slogan is :« if its traded it has to exist ». Anchoring this childish belief in the minds of consumers is very important to those who have no plan, model, programme or solution for the coming global reduction in oil and natural gas supplies, after their respective peak supply levels are attained.

Doing nothing serious to reduce oil and gas intensity of the world economy and society, and depending on anarchic and inefficient free markets to create alternate and renewable energy infrastructures worldwide runs the sure risk of catastrophic impacts on the so-called 'Growth Economy' and consumer society, now a global phenomenon, when physical shortage operates. This menace is however ignored by the apprentice sorcerors who run the Growth Economy. All effort is made to bolster the absurd claim that « the market will provide ».

We can note, however, that increasing numbers of oil industry leaders are now able to mention the words 'Peak Oil', for example the CEO of Total Oil SA, who believes that about 95 Mbd on an all liquids base will be the ultimate peak, and decline will follow quite shortly after peak output is attained. The question of resource conservation or husbandry of remaining resource is generally excluded from media treatment of the subject. Large oil producer countries whose leaderships do talk about conserving oil for future generations are usually presented, by the media in the oil-intense and oil-dependent 'postindustrial' countries, as only talking in the wind with a hidden agenda of further increasing oil prices by refusing to act logically, or greedily, by drawing down and exhausting their natural resources in the shortest possible time. Oil exporter countries, at least those without powerful military infrastructures, are expected to maintain their 'pumping performance' to feed the Growth Economy.

No Supply Side Solutions

This Aspo 7 conference, like preceding ones, drives home this simple fact, which is specially easy to explain by 'the Chindia syndrome'. The table of oil and natural gas intensities by country provides all that we need to know. If or when China and/or India attained even European current rates of oil demand per capita, let alone the OECD average rate (including the US, South Korea and Japan), of about 14 barrels/capita/year (2006-2007), their increased demand would make it necessary to find and develop several "new Saudi Arabia or Russia" to satisfy a radical increase in world oil demand.

- - SEE PPT PRESENTATION - -

This is not possible, and this simple fact has triggered emergence of two phenomenon. The first is the 'alternate and renewable energy' investor asset bubble, now the focus of at least 700 or 800 hedge funds, and what we can call the 'oil supply decline denial industry'. This second argues that in part thanks to 'oil market transparence', and also to the now rapidly growing alternate energy investment bubble, there will be no problems of energy shortage due to Peak Oil and Peak Gas. New supply, including for example Arctic Oil facilitated by climate change and the accelerating disappearance of the Arctic ice cap, will always be generated by rising demand and exhaustion of previous supplies. Supply and demand will always and finally balance out. A former president of the European Bank for Reconstruction and Development, J. Attali, likes to provide a so-called analogy of declining whale oil supplies at the end of the 19th C, which led to street lighting problems in European and US cities. His claim is that exhaustion of cheap whale oil supplies « caused the invention of electric street lighting », using abundant coal, oil and gas to substitute declining whale oil.

Denying the possibility of oil or gas shortage is now a powerful cottage industry with its own gurus, regularly wheeled into TV studios to perorate, but the most down-to-earth reason for denial is simple: the inability or refusal to face facts. Ironically perhaps, or even antinomically, public opinions in the most oil-intense and gas-intense societies, called 'postindustrial' but consuming every imaginable type of industrial product, are now supposedly very concerned about climate change. This supposed concern allows political and business leaderships of these countries to orient and focus consumer demand to new industrial products such as 'low carbon cars' or 'low energy washing machines', while creating new business opportunities for windmill and solar cell producers, and the levered financial investment structures supported by « alternate energy investing ». The net result is to simply add more energy on top of the fossil fuel pyramid, and maintains fossil energy demand at extreme high levels !

The simple fact that all natural tectonic, volcanic, seismic and geological sources of 'greenhouse gas' emissions total about **350 Million tons** per year, while fossil fuel burning emits about 80% of the **28 to 30 Billion tons** total of CO2 equivalent gases annually injected to the atmosphere should persuade most sane people as to the

‘probable link’ between fossil fuel burning and climate change. When this simple fact is grasped, the next logical step is to propose rapid and continuous measures and frameworks for reducing emissions. The underlying target and goal of reducing world oil demand, and shortly after that, gas demand, as well as coal demand, should not need defending.

Very obviously, alternate sources of energy will be needed, due to oil and gas presently supplying well over 60% of world commercial energy, and coal supplying more than 25% of world commercial energy..

Oil and gas intensity reduction is the objective of the Global Energy Transition Plan and Programme that I propose. This can certainly incorporate some aspects of Kyoto Treaty application in ratifying states, and countries linked by the Joint Implementation procedures. One major aspect of Kyoto application that can however be ‘economized’ immediately is the circus of carbon credits trading, a very small scale copy of world oil market trading – subject to exactly the same highly classic leverage and ‘market booms and busts’, for no discernable reason except creating volatility and extracting profit from that volatility.

Geopolitical Instability

Since the Russian invasion and partial occupation of Georgia, enabling Russia to create its own version of Kosovo, which was built on the ruins of Yugoslavia by the ‘democracy and human rights loving’ countries of the West, geopolitical instability in the Caucuses and Central Asia can be said to have increased upward by several notches. Including the Middle East, which is far from a haven of tranquility, this ‘oil and gas heartland’ region holds at least 60% or 65% of the world's remaining oil and about 60% of remaining known natural gas reserves.

This region, as we know, is a traditional focus or hinge point in the ‘geopolitical struggle for world dominance’ that was mapped out by Halford Mackinder, but today the reason for heightened rivalry is simple. The objective is control over diminishing fossil fuel reserves, production capacities, and control over their transport routes.

As the presidential running mate of John McCain has gayly confided to a chatshow interviewer on US television (Sept 2008), in her view the USA should be prepared to take war action against Russia in pursuance of America’s « peace agenda », or a least to safeguard oil import supply sources to the USA, which imports about 13.5 Mbd due to depleting domestic production and no coherent attempts at reducing oil consumption, we could alternatively surmise. European aims in this region are highly similar, as are those of the coming superpowers, China and India.

Large-scale military conflict in this quite easily defined, not huge region would almost certainly result in permanent damage to energy production, transport and export infrastructures, and sure devastation of local environments as well as massive loss of life. Yet this situation is antinomically accepted by many persons as a sort of fatality and therefore 'normal'.

Oil market analysts working up their trading advice for the Nymex, ICE, Singapore IPE, Tokyo Tocom and Dubai Mex rarely refer, at present, to the 'geopolitical risk premium'. We can surmise this is due to the urge of financial players to talk down oil prices and build up the value of flagging equities, in a world finance and banking sector crisis that has little or nothing to do with 'Oil Shock'.

Oil and Gas Intensity Reduction

The key requirement of **oil and gas intensity reduction** or doing more with less, or less and different with less, but in any case **using less** is heavily under-represented in current political and economic priorities in the OECD group of countries. Yet the OECD or 'rich world' countries have a clear and simple need to reduce average per capita oil and gas consumption

This 'window of opportunity' will rapidly diminish as Peak Oil impacts, and resource price inflation, investor uncertainty and economic, financial and monetary or currency difficulties rise. We can note that Wall Street analysts already refer to the 'recession dividend' for oil consumers. That is a hoped-for 'collapse' of oil prices (falling to a low price of about 80 USD/bbl) due to world economic recession, this recession cutting oil demand enough to 'stretch' world oil reserves a little longer. This would allow another asset bubble cycle to be set up and operated by financial market players, perhaps in about 2011-2015..This is current Wall Street 'thinking' or 'strategy'.

.More responsible persons will focus on near-term geological and physical realities, and underline that mindless slogans like « the market will provide » only deny attention to the urgent and simple need to cut back on oil and gas demand in the 'postindustrial' societies.

We have no difficulty forecasting that if our leaders and opinion forming media choose to ignore all reasonable warnings, *de facto* oil and gas intensity reduction through economic crisis and recession will do nothing except create 'pent up' oil demand in the next economic growth bubble, which is doomed to abort through exploding oil prices, exactly like the present (2005-2009) cycle. Each succeeding cycle will be shorter and more inflationary than the preceding one. A major cause of this 'fool's cycle of prosperity' will be the refusal to act coherently and purposively to reduce oil and gas intensity in the OECD 'postindustrial' countries.

To a certain extent, the reality of Peak Oil can be hidden in the mass of details that a 'traditional' financial crash, like 1987 or 1998 or 2001 will bring. Such 'classic crashes' are easily presented as 'housekeeping measures', after which bigger and better asset bubbles can be cobbled together, along the road to so-called universal prosperity. Unfortunately, the impacts of Peak Oil, and Peak Gas not long after, will be to create not a short-term financial crash, but an economic depression similar to 1929-1936.

After the 1929 financial crash there were 7 long years of economic depression, only broken by defense sector spending in preparation for World War 2. By about 2012, perhaps before, this will be the only rational outlook for the world economy, with oil

prices far beyond 250 USD/bbl and gas at perhaps 750 USD/1000 cu metres. The only rational alternative is to reduce oil and gas intensity and shift the global economy towards alternate and renewable energy, and the sustainable economy.

OECD focus for Start of Programme

Oil and gas intensity reduction must start in the OECD group not only because these countries have extreme high current intensities. Another powerful reason is that key emerging industrial countries, and especially China and India, are embarked on their own Energy Transition **towards** using more commercial energy per head of population, inevitably increasing their oil and gas intensity. The Emerging Economies are generally less able to reduce the growth of their oil and gas intensity in the near-term, due to very fast industrial growth, urban development, growth of economic infrastructures, mechanization of their agriculture, and rapid development of car fleets and the consumer economy exactly similar to the OECD 'postindustrial' countries. There can be no surprise at all that their oil and fossil energy demand growth is exactly like that of the OECD countries in the 'Trente Glorieuses' era of postwar reconstruction and development, about 1948-1978. During this long period, fossil energy demand of the OECD countries regularly increased by rates as high as 6% per year, year-in and year-out.

The only difference with today is that during the 'Trente Glorieuses' oil prices were around 1 US dollar and 50 cents-a-barrel (in nominal terms, about 7 USD/bbl in 2008 terms), until 1973-74. Even at 100 USD/bbl, today, neither China nor India have any particularly grave national budgetary problems paying for their oil imports, but this situation will radically change with higher oil prices and slower global economic growth, and above all with rising oil and gas intensity in the Emerging Economies. There is no advantage at all, for world stability and security, for the Chinese and Indian 'economic miracles' to implode or collapse like those of the OECD countries in the 1970s.

Oil and gas intensity reduction is a first part of Energy Transition, necessarily but not exclusively focused on the OECD countries. Within an easily-forecast period of time, oil and gas intensity reduction plans and programmes will also be needed in the Emerging Economies

Alternate Fossil and Renewable Energy

Because we are left essentially with coal and uranium as relatively abundant fossil fuels, and the renewable energy sources, the development of clean coal technology, nuclear power and renewable energy must be seen as convergent and complementary, not opposing goals. While OECD oil and gas intensity reduction, that is 'Negawatts not Megawatts' is a clear priority, and immediately applicable, the coordinated, transparent and automatically funded development of Alternate Fossil and Renewable Energy (AFRE) on a worldwide basis is the second leg of Global Energy Transition.

Coordinating and funding this worldwide and long-term effort is not possible if we solely resort to 'market mechanisms'. It is necessary to propose international effort and multilateral frameworks for Energy Transition. To this end, removing oil and gas the from the supercharged and rumour-driven arena of market trading will be needed. This ‘radical step’ will help enable another radical but necessary step : automatic funding mechanisms in a clear multilateral framework for the inevitably long-term and intense, and costly effort for developing the AFRE.

Some idea of the amounts implied can be obtained from suggesting that by about 2025 some 25 million barrels oil equivalent energy (Mbdoe) will need to be obtained from the AFRE. Taking the world oil and gas industry and its E&P (exploration and production) spending in 2006-2007, outside the national oil companies of producer countries, this totaled about 400 Billion USD, for a net addition to world oil and gas supply after depletion, of less than 1.5 Mbdoe.

We can be sure that current activity, mostly financial, generated by application of the Kyoto Treaty, specially the current phase or round of European ETS (emissions trading scheme), and CDM (clean development mechanisms) for associated countries, is remarkably ineffective in causing any structural change in the energy systems of ratifying countries, nor oil and gas intensity reduction – other than that caused by economic recession. This is another proof, if needed, that uncoordinated private market speculation, playing with CO2 emissions permits, does little or nothing for real world Energy Transition.

Energy Transition in the Real World

Any argument that recession-driven falls in oil and gas demand are not reversible the moment the economy swings back to growth, allowing the financial industry to cobble a new asset bubble, can be dismissed by looking at the evidence given by Russia. After its ‘austerity cure’ of the 1991-98 period, and specially since 2000 the Russian economy strongly moved back into growth. Today, after 8 years of solid economic growth fed by petrodollars and gaseuros, with Russian domestic gas and oil demand growth running at about 6%pa, the net result has been firstly stagnant, then declining net oil exports of Russia. This will quite shortly – probably by 2009 or 2010 - be followed by stagnant Russian natural gas exports, with reduction of net export supply of gas from Russia being possible by 2011, perhaps before, unless Iranian pipeline gas, and Qatari and other LNG suppliers ‘come to the rescue’.

All the nonOECD oil exporter countries, today, have internal or domestic rates of oil demand growth in the range of 4% to 7.5%pa, sometimes more. In other words, as national revenues increase in line with world oil, natural gas and other commodity prices, domestic energy and resource consumption of these countries increases rapidly. The so-called 'demand destruction' that Russia showed during its ‘transition to the market economy’, that is forced impoverishment and market operated pillage of its natural resources, was in fact only temporary. No real restructuring of the economy or society took place. No serious attempt was made to develop the AFRE in Russia. With a return to economic growth and reduced poverty, Russia’s domestic fossil energy consumption increased very fast.

What we can note is that the Russian case of 'austerity cure' and commercial energy 'demand destruction' was similar to the experience of all or most so-called "Sunset Commodity" producers and exporters through nearly 20 years, from about 1985. The Russian case was very intense, with collapse of the economy and inability to service sovereign debt, making Russia almost unique among developed urban-industrial economies, but commonplace in low income commodity exporter countries of Africa, Latin America and elsewhere. In any case, Russia's economic collapse and status of "Price Taker", forced to accept derisorily low prices for its oil and gas exports for many years is neither a model for us all, nor a long-term model for sustainable adjustment to declining oil and gas reserves worldwide.

Energy Transition needs worldwide development of the AFRE, and this includes AFRE development in the oil and gas exporter countries. Towards this end, these countries will surely not accept to play 'Price Takers' again, if the OECD group chooses to cause a global economic recession through gouging interest rates to extreme high rates, then using the IMF and IBRD to impose austerity and maximised rates of resource exports to maintain soft prices on world markets. Guaranteeing high and remunerative prices, and export revenues for fossil energy exporters will be an important element of any sustainable plan and programme for Global Energy Transition.

It is therefore obligatory to propose methods and frameworks for maintaining revenues to the fossil energy exporter countries, during this global transition effort. Transparent frameworks for energy transition will need permanent fora bringing together major energy exporter countries, and major importer countries. Through operating levies on all transborder fossil energy trade, financial resources for providing support to rational and worldwide development of the AFRE can be generated, and administered by delegates from the major exporter, and major importer countries.

Electrification

In today's globalising economy there is a present *de facto* continuing and almost total dependence on fossil fuels. One key related cause, and result in the energy economy, is ***rapid electrification***.

In the Emerging Economies, notably, electricity demand growth is running at about 8% or 9%pa, and national power production is mostly from coal burning, emitting the maximum possible CO2 per unit kWh output. We know that wind and solar PV electric power production, nuclear electricity, and hydroelectric power in total contribute around 20% of world electricity, but more than 70% is produced from coal, natural gas and oil. The very high growth rate of electricity demand results in fossil energy being chosen for power generation, rather than AFRE, or saving electricity, as the short-term, most economic response to demand growth.

With urban development and growth of the service sector, electricity demand grows faster than demand for other forms of energy. As we can note, wind electricity and solar PV electricity are the most important sectors for Alternate Energy investing and development – and only supply electricity. But fast growth of

electricity demand, specially in the Emerging Economies, in fact leads to **fossil energy solutions** being chosen. In overall terms, this tends to maintain or increase dependence on fossil fuels, not decrease it.

If we take the case of the US and the giant emerging economies, India and China, their current electricity supply systems are about 55% dependent on coal, for the USA, over 60% dependent for India, and more than 75% dependent on coal for electric power in China. Any time you use a computer and connect to the Internet in these countries you are dependent on, and burning coal.

Strong and sustained growth of global electricity demand, notably to power the so-called « Internet and cellphone revolution » leads to strong coal demand growth.. Today in the USA around 10% to 14% of all electricity consumption is needed just to run Internet servers for PCs and cellphones. World energy coal, and coking coal (for steel production) demand, running at more than 6 Billion tons-per-year, is currently growing at around 6.5%pa. This alone ensures a 'healthy growth rate' for global CO2 emissions, whatever the rhetoric of Alternate & Renewable Energy, or 'Cleantech' investor hedge funds, and the rhetoric of political leaders who talk about « 20% by 2020 » for the percent of ARE in total national energy supply by 2020.

Setting the Main Priorities

Energy Intensity Reduction in OECD Countries

The urgent need for reducing oil and gas intensity of the OECD 'richworld' must be set as the No 1 priority. The mature urban-industrial or so-called 'postindustrial' societies of the OECD, with rising social and political concerns for climate change and the environment have in fact never consumed so much and so many industrial goods, metals, materials and services as today. Not at all surprisingly, they have also never consumed so much fossil energy per capita, as today. Reducing average fossil energy intensity per capita is the urgent long-term need for real world energy transition. Refusal to face this simple fact is likely the most pernicious problem we face.

.

International Energy Transition must first applied in the shape and form of long-term plans ***starting in the short-term*** aimed at reducing oil and gas intensity in the OECD group. In turn this will require initiatives by political and business leaders, and widespread mediatization of why we need transition. In turn, this results in the need for ***accelerate development of renewable energy.***

This will not be possible without large scale and coordinated measures for rapid development of alternate and renewable energy on a worldwide basis. The likely 'window of opportunity' for debating, discussing, negotiating and starting application of needed measures will unfortunately be short, due to the impacts of Peak Oil starting to reduce physical oil availability on world markets by 2009. As already noted, Peak Gas for EU countries dependent on Russian gas exports will likely start by 2010.

Only the wide variety of small scale, uncoordinated, almost anarchic 'alternate energy' measures favoured by Kyoto treaty interpretation in the EU-27, Japan and

Canada, as well as CDM (clean development mechanism) operations in associated countries are currently in operation. In global terms, net energy supply from these measures is extremely small. Estimates for net energy supply impacts of Kyoto Treaty application in ratifying countries, and CDM application in Associated Countries through 2005-2008 to date, are at most 0.5 Mbdoe.

As cynics say, the Kyoto Treaty is essentially a ‘blank cheque for building gas fuelled electric power plants’, wirth a few photogenic windmills at the perimeter. As natural gas prices rise, the urge to build gas-fuelled electric power plants ‘to save the climate’ diminishes quite fast.

Price Signals and Economic Adjustment

We can be sure and certain that financial markets have already anticipated approaching Peak Oil through 2005-2007, concretized by an 'exuberant round' of massive price rises for primary products right across the board, from energy commodities, through metals and minerals, to soft commodities. In the case of traded oil, and natural gas and coal, this “exuberance” was in very high gear, and accelerated through Jan-Jun 2008, only to meet « institutional resistance » from the private banks along Wall Street, such as Bear Stearns, Lehman Bros, Merrill Lynch, Goldman Sachs, and the private banking subsidiaries of the major depositary banks, for example HSBC, Citigroup, Barclays, BNP, Santander, etc.
We can be very sure that when needed, oil prices can be made to explode upwards again, as they did in the first Semester of 2008 (about +50% in 4 months). This only concerns oil market trading. Supply side realities of Peak Oil make it vital to remove oil and natural gas from the trading arena or circus.

World oil production and supply is now rigid or stagnant, and de-connected to the demand side, where 'robust growth' is the reality, despite strong and continuous attempts being made to counter this reality, using manipulated data. Favored manipulation includes supposed ‘price elastic’ fall of oil demand, which in fact is very weak. One example is car fuel demand contraction in the EU27 countries, of only ca. 3% in volume for each 33% rise in gasoline and gasoil price, in the period 2007-2008 to date.

Another favored manipulation is to always and deliberately underestimate world oil demand growth, claimed by the US EIA, OECD IEA, Eurostat and many oil majors such as Exxon and BP to be at 'very low rates', only just above 1.25%pa.

OPEC, we can note, also publishes ridiculously low estimates of world oil demand growth. Coupled with what are in fact very minor seasonal or other changes of fuel stocks and inventories in OECD countries, particularly the USA, extreme price volatility is maintained, to the delight of traders. In turn, this helps maintain the belief that adequate supply really does exist. In turn, this « conventional logic » suggests that high oil prices are only transient, due to “inventory and stock problems”, and supply will always rebound.

This syndrome, or psychosis we can call the ***market-only*** response to any problem concerning oil, gas, coal and any other mineral, for example gold, platinum, tin, lead, iron ore or bauxite.

The Real Solution

The solution is very simple and very radical, but also inevitable. As already noted above, we will need to remove oil and gas from the trading arena. This will need an international agency, charged with supply and price issues, and modeled on the International Energy Agency, but including ***all major oil and gas producers*** as well as consumer countries.

- - SEE PPT PRESENTATION - -

THE IOGA
This proposed entity could be called the ***International Oil & Gas Agency – IOGA***, charged with deciding and allocating oil and gas supply volumes, and prices, on a 90-day forward basis. Progressive price increases for internationally supplied (cross border) oil and gas will be applied by the IOGA which will issue regular notes and information concerning mid-term and long-term oil and gas reserves and production trends. Through the IOGA, and International Levy for promoting, and in certain cases funding renewable energy programmes in non-OECD countries will be operated.

Institutional Linkage – the IOGA

The IOGA will respond to and interpret decisions made by the ***International Energy Transition Agency-IETA*** which by necessity will be a UN-related agency similar to the coming UN Climate Change Agency, and existing UN-related and international institutions and agencies such as the OMC
or MARPOL. Like the IOGA, the Energy Transition Agency will necessarily include *all major oil and gas producers.*

An important need is ensuring coordinated and automatic-funded worldwide development of renewable energy sources, as well as energy economy and economic restructuring for reduced oil and gas intensity in the OECD countries. This in turn requires an energy finance institution.

This can be modeled on the IMF.
This entity can be called the ***International Energy Fund-IEF.***

The IEF - International Energy Fund

Like the IMF, this Fund will act to ensure compliance with oil and gas intensity reduction measures in applicable countries (mostly OECD), and act to ensure automatic and sufficient funding of worldwide projects for large-scale development of renewable energy (all nations and territories). Similar to the
SDR (Special Drawing Rights) system of IMF-provided financial support in economic emergency conditions, and reciprocal obligations of drawing countries to carry out

'good housekeeping' measures (conditionality of loans), the IEF will ensure national compliance with set and agreed national oil and gas intensity reduction plans and targets

.

IEF Compliance Instruments – ODRs and GDRs

Special international energy drawing rights, modeled on the SDR system (of the IMF) will be set, that is ***Oil Drawing Rights-ODRs*** and ***Gas Drawing Rights-GDRs,*** these financial instruments being used in the compliance system for oil and gas intensity reduction for each member nation.

To be sure, the Kyoto Treaty system and framework of obligations, and the rather incoherent and very ineffective system of financial 'sticks and carrots' enacted by the treaty, can be integrated into the new IET Plan and process that will supercede and replace the Kyoto plan and process. At present it is of course hypothetical or even 'provocative' to sketch out International Energy
Transition goals, frameworks and measures, but the intrinsic component and vital element of accelerated and worldwide development of the renewable energy sources may be immediately accepted as needing special multilateral frameworks.

The IETA will set world, regional and national targets for renewable energy development, and the IEF will ensure adequate and automatic financing for achieving these targets.

An operating and technical agency will also be required, which we can call the ***International Renewable Energy Agency-IREA***,
integrating UN agencies such as the UNDP and UNCNRET, but requiring very large and permanent technical resources, as well as manpower. Very close linkage between the IEF and IREA will be needed, throughout the lifetime of these institutions, which will be at least 50 years.

Near-Term Realities

To be sure, the above frameworks may look attractive to anyone who understands the seriousness of the real world situation, but first we need ***public and political demand*** for transition, and this is frankly unlikely without 'extreme oil prices', followed by serious energy supply shortage, and the inevitable and
linked downstream economic, financial and monetary difficulties or crises.

Unfortunately and as already referred to above, we have a rather 'classic' finance and bank sector crisis operating in the world economy, quite easily able to 'mutate' into economic depression, following what economic journalists call 'the right signals'. Talk of Oil Shock was possible, when we had Osama bin Laden's favorite oil price (144 USD/bbl) earlier this year : at 100 USD/bbl the public is for the least blasé, in fact 100-dollar oil is almost cheap !

The basic reason for this is because so many social, economic, political and cultural factors support or reinforce current profligate and unsustainable fossil

energy consumption in the OECD countries, and very fast growth of fossil energy consumption in the Emerging Economies. Public acceptance in many countries that there is an urgent need to mitigate climate change, then reduce climate change, should not be confused with large uncertainty concerning ***how*** to do it – and by preference not by increasing gasoline or diesel fuel prices too much !