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"AllmachtoderOhnmacht? Klimaforschung und Klimapolitik"

Ladies and Gentlemen,

We meet here a week or so before the formal UN climate negotiations resume in Durban, South Africa.

And some six months before Rio+20—20 years after the Earth Summit of 1992 that established the UN Framework Convention on Climate Change and later the Kyoto Protocol.

The world is markedly different from that of the last decade of the 20th Century—geo-politically, environmentally, socially and economically.

The optimism of 1992, following the fall of the Berlin Wall, has more recently been replaced by a measure of pessimism in some quarters, increasing bipolarity, a sense of frustration not least with the United Nations and concern almost everywhere about the future of our economies and of unemployment, particularly but not exclusively among the young.

At the end of last month, the seventh billion person entered the world.

UNEP marked this with the publication of an indicator booklet as part of build up to our Global Environmental Outlook-5 which will be launched in May next year—one month before Rio+20.

Among the indicators spotlighted:-

- The global population in 1992 was 5.5 billion—it has now risen by 26 per cent;
- Plastics production has climbed by 130 per cent;
- Biodiversity has declined by 12 per cent;
- The number of people living in slums has risen by over 170 million;

But there is also some good news.

- Ozone layer depleting substances have been cut by 93 per cent;
- And globally drinking water coverage has expanded by 13 per cent;

In respect to climate change however, the negative trends continue.

Greenhouse gas emissions having climbed 36 per cent since 1992 despite having treaties in place to stabilize and to cut emissions.

And instead of responding to this by fully implementing the instruments available—specifically the Kyoto Protocol--and at a time when we need both the technologies and policies to make a difference are abundant, what do we do?

Well as the Arctic retreats, the overall response is to see this as an opportunity to drill for more oil.

Meanwhile many of the old, tired and downright irresponsible arguments that claim combating climate change will destroy economies are re-surfacing in some countries.

This can fuel public disquiet, fear for the future and a paralysis among many politicians—especially in some countries of the developed world.

It is also factually and flatly wrong and part of a competition and a battle of ideas between those industries and sectors who have invested in an old economic model and new up and coming ones.

Getting Back to Basics

It is high time that the world got back to basics, looked climate change in the eye, re-engaged with the science and embraced the multitude of options that offer clear ways out of the dilemma.

Countering climate change does not need to be a break on economies. But instead an opportunity for growing them but in a way that generates jobs in clean energy systems, energy efficiency and natural resource management, that invests in carbon storage of forests and other ecosystems and fast forwards the clean, green and high-tech industries of the 21st century.

UNEP has termed this transition the Green Economy.

It has become, in the context of sustainable development and poverty eradication, one of the two main themes of Rio+20 next year.

Before I go into the Green Economy in more detail and the prospects for Rio+20, let me return to the question of getting back to basics and looking climate change, but also the environmental change phenomenon, squarely in the eye.

The Reality of the Emissions Gap

Last year, following the sometimes maligned UN climate change negotiations in Copenhagen, UNEP convened a global group of research and modeling centres.

The aim was to assess just what the commitments of developed countries and pledges of developing ones might mean in terms of keeping a 21st century temperature rise under 2 degrees C—even better, under 1.5 degrees C.

International negotiations can often become opaque and impossible for an intelligent person to follow—the minutia can dominate over the big picture and the aims.

Meanwhile, many of the pledges made by developing nations in particular are contingent on other actions.

Unraveling these various strategies in a clear and comprehensive way was the goal.

*The Emissions Gap Report: Are the Copenhagen Accord Pledges Sufficient to Limit Global Warming to 2° C or 1.5° C?*carried sobering but also inspiring conclusions. [1]

According to this assessment, global emissions should be around 44 Gigatonnes (Gt) of CO_2 equivalent in around ten years' time in order to have a good chance of keeping a global temperature rise under 2 degrees C.

If all the pledges made at, and after, the 2009 UN Copenhagen climate summit were met in full, including the financing pledges, emissions might hit 49 Gt leaving a gap of 5 Gt of CO_2 equivalent that needs to be filled by greater action.

In other words, it is possible to avoid some of the more dangerous scenarios if we get all hands on deck.

In around two weeks' time, we will be releasing in London a follow-up report.

While I cannot disclose the detailed findings today, I can assure that the gap remains firmly in place with another year having passed and thus with perhaps nine years left to bridge it.

[1] The Emissions Gap Report: Are the Copenhagen Accord Pledges Sufficient to Limit Global Warming to 2° C or 1.5° C? November 2010

And while that gulf continues and may even be widening, the science on just what kind of world is likely without transformative change, gets ever more detailed and alarming.

Reconnecting with Climate Science

The main risk analysis is the Intergovernmental Panel on Climate Change (IPCC)—established by UNEP and the World Meteorological Organization--whose fourth assessment was released in 2007. [2]

The IPCC's fifth assessment will be released in 2013/2014, but already many teams of scientists claim the forecasts and scenarios of future climate change in the fourth IPCC assessment are being overtaken.

For example, recent conclusions from the Snow, Water, Ice and Permafrost in the Arctic report of the Arctic Monitoring and Assessment Programme (AMAP), published in May, point to likely global sea-level rise of close to a meter or more by the end of the century as a result of, for example, faster melting of the Greenland ice sheets. [3]

This compares with the 0.18 and 0.59 meters forecast by the IPCC four years ago.

A one-meter rise in sea level could, for example, flood over 15 per cent of Bangladesh's land area; threaten large parts of coastal cities such as Lagos, Cape Town and elsewhere and overwhelm, along with storm surges, small island developing States from the Maldives to Tuvalu.

The Copenhagen Diagnosis of 2009, designed as an update on the IPCC's fourth assessment, identified the potential for a temperature rise by 2100 of as much as seven degrees Celsius if there is no action to cut emissions. [4]

In a series of papers published last year by the Royal Society of the United Kingdom, some researchers suggest a worst case scenario of a 4 degree Celsius temperature rise by around 2060, with perhaps even higher rises in regions like southern Europe and North Africa. [5]

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[2] IPCC Fourth Assessment Report: Climate Change 2007 http://www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html

[3] Snow, Water, Ice and Permafrost in the Arctic report of the Arctic Monitoring and Assessment Programme (AMAP) May 2011 http://www.amap.no/swipa/

[4] The Copenhagen Diagnosis: Updating the World on the Latest Climate Science http://www.copenhagendiagnosis.org/

What the newly emerging science is in many ways pointing to is also tipping points, sudden and perhaps irreversible changes accompanied by feedback mechanisms--an Arctic free of summer ice by 2030, for example, could reduce the amount of sunlight reflected back into space leading to more heat absorbed by the Earth. [6]

Another, related feedback mechanism is the thawing of the permafrost in the Arctic which in turn might trigger releases of ancient stored carbon from the tundra.

In respect to food security, temperature rises alone may be more severe in impact than previously thought. A paper this year in *Nature Climate Change* has tapped previously un-utilized data from more than 20,000 maize trials in Africa. [7]

It has concluded that roughly 65 per cent of present maize-growing areas in Africa would experience yield losses for a one degree Celsius warming even under optimal rain-fed management.

Another paper in *Nature Climate Change*, published a few weeks ago by researchers at the National University of Singapore, suggests that some animals and plants are already getting smaller as a result of climatic impacts on their habitats—with other potentially profound implications including for food supplies. [8]

What the ever evolving scenarios and scientific findings suggest are continuing, accelerating and even "tipping point" trends linked to environmental change, including climate change.

These, suggest experts, have fundamental implications for weather, settlements, infrastructure, food insecurity and lives, livelihoods and development.

This is happening in a world that is set to rise to over nine billion by 2050 and on a planet where resource constraints are rapidly emerging.

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[5] Four degrees and beyond: the potential for a global temperature increase of four degrees and its implications Mark New1,*, Diana Liverman2, Heike Schroder3 and Kevin Anderson4,5 Philosophical Transactions of the Royal Society http://rsta.royalsocietypublishing.org/content/369/1934/6.abstract

[6] Press Release: Arctic sea ice continues decline, reaches second-lowest level: The National Snow and Ice Data Center (NSIDC) October 2011 http://nsidc.org/news/press/20111004_MinimumPR.html

[7] Nonlinear heat effects on African maize as evidenced by historical yield trials-David B. Lobell,1Marianne Bänziger,2Cosmos Magorokosho2&Bindiganavile Vivek2 Nature Climate Change 13 March 2011 http://www.nature.com/nclimate/journal/v1/n1/full/nclimate1043.html

[8] Shrinking body size as an ecological response to climate change, Jennifer A. Sheridan1&David Bickford1Nature Climate Change(2011)http://www.nature.com/nclimate/journal/vaop/ncurrent/full/nclimate1259.html

The resource constraints are part of the story of climate, but also environmental change generally.

Indeed, according to UNEP's International Resource Panel, consumption of several key natural resources could triple by 2050 to 140 billion tonnes unless that consumption is decoupled from economic growth. [9]

Meanwhile, nationally and regionally climate change has the potential to sharply intensify human displacement bringing communities into increasing competition for finite natural resources with worldwide repercussions for the stability of the global economy.

Climate Change and the Wider Sustainability Challenges

It may be premature to link man-made climate change with an increase in natural disasters and displacement of people—disentangling natural variation from rising greenhouse gas emissions is so to speak, not there yet.

But there is also no point in waiting for perfection and 100 per cent proof given the evidence to date.

A World Bank study has estimated that a one-meter sea-level rise would affect 84 developing countries alone. [10]

In 1998, Hurricane Mitch impacted Honduras with 290 km/hour winds and three meter waves. Nearly one meter of rain fell on the region.

An estimated 70-80 per cent of Honduras's transportation infrastructure was destroyed and existing maps of the country were rendered obsolete. [11]

President Carlos Roberto Flores said at the time that the hurricane had destroyed 50 years of progress in the country and caused US$3.8 billion of damage.

Earlier this year Norwegian Refugee Council and the Internal Displacement Monitoring Centre (IDMC) estimated that "sudden natural disasters" displaced 42 million people in 2010. [12]

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[9] Decoupling Natural Resource Use and Environmental Impacts from Economic Growth, International Resource Panel 2011 http://www.unep.org/resourcepanel/decoupling/files/pdf/Decoupling_Report_English.pdf

[10] The impact of sea level rise on developing countries : a comparative analysis World Bank http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2007/02/09/000016406_20070209161430/Rendered/PDF/wps4136.pdf

[11] Mitch: The Deadliest Atlantic Hurricane Since 1780http://www.ncdc.noaa.gov/oa/reports/mitch/mitch.html

[12] Norwegian Refugee Council/IDMC June 2011 http://www.nrc.no/?did=9570125

In 2010, over 90 per cent of disaster displacement within countries was caused by climate-related hazards, primarily floods and storms. Climate scenarios expect such weather events to increase and or intensify as a result of accelerating climate change.

The UN Office for the Coordination of Humanitarian Affairs (OCHA) and the IDMC have suggested that at least 36 million people were displaced in 2008 due to "sudden-onset natural disasters" of which over 20 million were displaced due to sudden on-set of weather-related disasters.

Their report also points to research from other sources that suggests that many millions of people are also displaced annually as a result of climate-related, slow-onset disasters such as drought-for example like the recent and on-going drought in the Horn of Africa.

Recent studies have found that up to 12 per cent of the world GDP is already at risk from existing climate patterns. For example, the value of GDP exposed to tropical cyclones alone more than tripled from US$525.7 billion in the 1970s to US$1.6 trillion in the first decade of the 2000s. [13]

Natural disasters challenge food security in several ways-loss of productive land from sea-level rise, destruction of crops and damage to food distribution networks.

Meanwhile, we now live in a world so interconnected that a drought or a flood in one part of the globe one day can challenge supply chains and move commodity markets the next.

Some of the emerging temperature rise scenarios may also challenge the basic ability of some parts of the world to practice agriculture as a result of crops being unable to tolerate new climatic conditions. [14]

Or, for example, as a result of the drying out of forests--natural systems that recycle nutrients needed to grow crops and which are also the font of many rivers needed for irrigation.

The IPCC's 2007 assessment, for example, concluded that "up to 40% of the Amazonian forests could react drastically to even a slight reduction in precipitation".

In an open letter, published in March last year, Brazilian and American scientists carrying out research in the Amazon outlined findings from the 2005 drought that confirmed a large surge in tree mortality alongside sharp increases in forest fires.

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[13] Global Assessment Report on Disaster Risk Reduction 2011
http://www.preventionweb.net/english/hyogo/gar/2011/en/what/chapter2_2_4.html

[14] UNEP (2009). The Environmental Food Crisis—The Environment's Role in Averting Future Food Crises, UNEP/Arendale

Meanwhile, many fish stocks are already depleted as a result of over fishing. [15]

Higher surface sea temperatures can also affect fish stocks. Higher sea temperatures in the North Atlantic have been linked to declines in copepods, creatures towards the base of the food chain upon which young fish such as cod rely for food.

Higher sea surface temperatures are also likely to threaten coral reefs--key ecosystems linked to healthy fish stocks. 500 million people in developing countries rely on fisheries and aquaculture for livelihoods.

How Can a Green Economy Bridge the Ambition Gap

Ladies and Gentlemen,

There will be those who would accuse someone delivering a speech like this one as an alarmist or that one should take a wait and see stance.

Others might throw up their hands and say until the Americans move or the Chinese or someone else, real action cannot and will not happen—that Europe going alone is not enough, a drop in the ocean.

Well, as the gap report and other reports spell out time is not on our side and if one sounds alarmist, so be it—we should all be alarmed by the risk analyses unfolding.

The world also cannot go at the speed of the slowest and let me perhaps suggest that even in those countries where governments are currently glacial, a great deal of transformative change is actually underway at the level of local authorities, companies and civil society.

Indeed, I would contend that there are countries and stakeholders within those countries who have seen the writing on the wall in respect to looming resource constraints and the climate challenge.

And they are recognizing that managing down their environmental footprint will prove to be the best policy choice and investment strategy in a competitive 21st century.

The challenge is to encourage, accelerate and to scale-up these transitions to a low carbon, resource efficient Green Economy that is manifesting itself everywhere.

When UNEP launched its Global Green New Deal/Green Economy initiative in 2008, I do not think we or anyone else could have imagined how far and how fast it would evolve and become a hot currency of international discourse.

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[15] UNEP (2010b). UNEP Emerging Issues: Environmental Consequences of Ocean Acidificiation: A Threat to Food Security. UNEP, Nairobi

Indeed the idea that it might become a central theme at Rio+20 would have seemed surprising then, given the speed at which the UN and its member states sometimes picks up and runs with new ideas.

But perhaps the ideas and policy options outlined in this work have touched on a deep seated frustration among nations, an awareness of the threats and challenges now emerging and yearning for an antidote and a long term vision for change.

One that can act as an implementer for sustainable development and one that echoes to the different starting points of developed and developing countries and that is as relevant to North America as it is to Namibia or a small Pacific island like Niue.

Earlier this year, UNEP presented the findings of its draft report-- *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*—to our annual gathering of environment ministers in Nairobi. [16]

Investing two per cent of global GDP into ten key sectors can kick-start a transition towards a low carbon, resource efficient Green Economy.

The sum, currently amounting to an average of around US$1.3 trillion a year and backed by forward-looking national and international policies, would grow the global economy at around the same rate if not higher than those forecast, under current economic models.

But without rising risks, shocks, scarcities and crises increasingly inherent in the existing, resource-depleting, high carbon 'brown' economy.

As such, it comprehensively challenges the myth of a trade-off between environmental investments and economic growth and instead points to a current "gross misallocation of capital".

The report sees a Green Economy as not only relevant to more developed economies but as a key catalyst for growth and poverty eradication in developing ones too, where in some cases close to 90 per cent of the GDP of the poor is linked to nature or natural capital such as forests and freshwaters.

It cites India, where over 80 per cent of the US$8 billion National Rural Employment Guarantee Act, which underwrites at least 100 days of paid work for rural households, invests in water conservation, irrigation and land development.

- This has generated three billion working days-worth of employment benefiting close to 60 million households.

[16] UNEP (2011b). Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication - A Synthesis for Policy Makers. United Nations Environment Programme, St-Martin Bellevue

In addition to higher growth, an overall transition to a Green Economy would realize per capita incomes higher than under current economic models, while reducing the ecological footprint by nearly 50 per cent in 2050, as compared to business as usual.

The report makes the case that over time the number of "new and decent jobs created" in sectors - ranging from renewable energies to more sustainable agriculture - will offset those lost from the former "brown economy".

For example, investing about one and a quarter per cent of global GDP each year in energy efficiency and renewable energies could cut global primary energy demand by nine per cent in 2020 and close to 40 per cent by 2050, it says.

- Employment levels in the energy sector would be one-fifth higher than under a business as usual scenario as renewable energies take close to 30 per cent of the share of primary global energy demand by mid-century.
- Savings on capital and fuel costs in power generation would under a Green Economy scenario, be on average US$760 billion a year between 2010 and 2050.

The work also highlights enormous opportunities for decoupling waste generation from GDP growth, including in recovery and recycling while also providing a climate benefit.

- The Republic of Korea has, through a policy of Extended Producer Responsibility, enforced regulations on products such as batteries and tyres to packaging like glass and paper, triggering a 14 per cent increase in recycling rates and an economic benefit of US$1.6 billion
- Brazil's recycling already generates returns of US$2 billion a year, while avoiding 10 million tones of greenhouse gas emissions; a fully recycling economy there would be worth 0.3 per cent of GDP.

I could cite many other examples of where more intelligent investments in forestry to sustainable transport can deliver action of climate change and other sustainability challenges

So how is all this going to happen?

Firstly, and in many ways it already is as the case studies in the Green Economy report underline—and there are many other empowering statistics.

- Last year $211 billion was invested in renewable energies across the globe with the highest investments in a country like China but also rising ones in Africa and Latin America as well as significant ones in Europe

- In respect to solar 17.5 GW was installed in 2010, up 130% from 2009. And Photo Voltaic installations are forecast to rise further this year, by perhaps 20.5GW, taking global capacity to around 50 GW – the equivalent of around 15 nuclear reactors

- Sixty regional and local governments, responsible for 15% of global greenhouse-gas emissions, are also taking action. Québec and São Paolo, to cite just two examples, are aiming for cuts of 20% below 1990 levels by 2020

- Big companies, from banks to airlines, are contributing as well. The US retailer Wal-Mart, for example, plans to cut emissions equivalent to 3.8 million cars, in part by implementing energy-efficiency measures at its Chinese stores.

Ladies and Gentlemen,

From Durban to Rio+20

The UN climate convention meeting in Cancun last year got the negotiations back on track and Durban, beginning next month, needs to keep the ship moving and on a course that can ultimately lead to a new international agreement.

The formal negotiations have given the world a range of flexible mechanisms—from emissions trading to the Clean Development Mechanism—that has spurred some of these low carbon transformations.

Durban could also decide to move forward on Reduced Emission from Deforestation and forest Degradation (REDD or REDD+)—many countries, from the Democratic Republic of Congo to Indonesia, are ready or almost ready to forge ahead. [17]

US$1 billion worth of pledges from Norway to Indonesia have already triggered a moratorium by the government in Jakarta on clearing tropical forests for new palm oil plantations.

Likely benefits include climate but also more secure water supplies, jobs in natural resource management and indeed biodiversity including the orangutan—in other words REDD+ is a Green Economy measure if ever there was one.

[17] Keynote Address by Achim Steiner at the Opening Session of the High Level Forum on Forests and Climate Change for Development, http://www.unep.org/newscentre/default.aspx?DocumentID=2655&ArticleID=8892

Countries also need to anchor their commitments and pledges made in and after Copenhagen with the UN climate convention and launch the Green Climate Fund and provide options on how to generate the agreed climate finance of US$100 billion per year by 2020. [18]

Durban also needs to deliver tangible progress towards operationalizing in 2012 the new technology and adaptation institutions that were agreed in Cancun in 2010.

Moving forward on REDD+ in Durban would also send a strong and positive signal to Rio+20—a meeting and most probably a summit that will seek to forge a series of big cooperative agreements.

How might it make a difference?

Firstly, by tackling some of the perversities or absurdities of our economic system that seems to reward polluters, deter investors from investing in a new economy and perpetuate the status quo rather than rewarding those who strive to do the right thing—in self-interest or philanthropically.

- Fossil fuel subsidies range from US$400 - US$650 billion per year, depending on the price of oil. About 75% - 80% of that is given out in the form of consumption subsidies, where governments fix the price of transport fuel, kerosene, or electricity generated from fossil fuels and pay the difference between that price and the world market price.

Most of the consumption subsidies are provided in the developing countries, which can pay a high price.

When the oil price peaked in 2008, Indonesia stated that its subsidies to fossil fuels were higher than government investment in health, education and infrastructure development taken together.

Taking an average figure of half a trillion dollars per year, we are subsidizing fossil fuels at a rate of eight times what it would cost annually to fully implement the Millennium Development Goals.

Or four times what it would cost to bring Official Development Aid up to the 0.7% target.

Fossil fuel subsidies amount to a huge inducement to prefer carbon-based fuels over the alternatives and seriously tilt the playing field away from renewables. [19]

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[18] Organgutans and the Economics of sustainable Forest Management in Sumatra, UNEP/GRASP/PanEco/YEL/ICRAF/GRID-Arendal, 2011.

[19] Reforming Energy Subsidies, UNEP, 2008: http://www.unep.org/pdf/pressreleases/reforming_energy_subsidies.pdf

Just eliminating fossil fuel subsidies, according to the International Energy Agency, would provide 40% of the carbon reduction needed to hold global warming to the 2 degree ceiling.

Efforts are underway to reform these subsidies - mostly motivated by a need to reduce national deficits in a time of economic crisis. [20]

The G-20 has a commitment (to phase out, over the medium term, inefficient fossil fuel subsidies that contribute to wasteful consumption).

There is also a Friends of Fossil Fuel Subsidy Reform that has been created, with Costa Rica, Denmark, New Zealand, Norway and Switzerland as members. There is a tipping point coming which could be finalized at Rio+20. [21]

But Rio+20 cannot just be about subsidies.

- Public purchasing accounts for 23% of GDP on average around the globe. In some countries, like Brazil and India, it approaches 50%. In the OECD, it averages 15% of very large economies.

The 23% can easily enough tip entire markets into the sustainability space. It is calculated that if California, Illinois, Ohio, New York and New England adopt a new fuel efficiency standard, it would become the new standard for the US because it will no longer be worthwhile for it to produce to a lower standard.

The same is true in virtually all markets - the tipping point is reached well below the 50% range.

So governments could commit to introducing sustainability criteria in their purchasing in a set programme, beginning immediately with what is ready today - forest products, fish products and organic food.

And widening the circle as agreed standards emerge and as markets are available to provide the desired goods. This pledge is fully possible at Rio + 20.

- While perverse incentives like subsidies are part of the problem, less well known are things like investment agreements.

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[20] Increasing the Momentum of Fossil-Fuel Subsidy Reform: Developments and Opportunities, GSI/UNEP; http://www.globalsubsidies.org/subsidy-watch/events/gsi-unep-forthcoming-conference-fossil-fuel-subsidy-reform

[21] The Friends of Fossil Fuel Subsidy Reform: Supporting the G-20 and APEC commitments , GSI, http://www.globalsubsidies.org/subsidy-watch/commentary/friends-fossil-fuel-subsidy-reform-supporting-g-20-and-apec-commitments

There are over 2,600 bilateral investment treaties. Most contain clauses under which government action - for example legislating a preference for clean energy - can be attacked as a form of indirect expropriation by those invested in conventional energy.

Disputes are settled with reference to contract law only, and behind closed doors. There is no provision for the defense of public interest.

More recently, these agreements and contracts between investors and host governments contain stabilization clauses that freeze the situation at the time of the investment.

This has a chilling effect on progress in social or environmental legislation, especially since settlements can run into the billions.

Could this be another outcome for Rio+20?

There are many other possibilities that can reviewed and brought forward for Rio +20.

We can also find a new way of defining wealth that expands GDP beyond its current, narrow definition.

The report *Consumption Dilemma-Leverage Points for Accelerating Sustainable Growth* prepared by Deloitte Touche Tohmatsu and the World Economic Forum makes some interesting points. [22]

It suggests the Genuine Progress Indicator, or GPI, as an alternative or evolved metric that measures the 'sustainability of income through economic and also social and environmental indicators.

The proposal points out that in the United States, GDP has grown steadily between 1950 and 2004, but as measured by GPI it has actually stagnated since the 1970s.

- Another 'big ticket' items could be a cooperative agreement on so called short lived climate forcers such as black carbon and ground level ozone—black carbon is emitted from sources such as cooking stoves, kilns and diesel engines.

Over a decade of research, UNEP and scientists have been piecing together the impacts of these on climate but also on human health and agriculture.

[22] The Consumption Dilemma: Leverage Points for Accelerating Sustainable Growth, Deloitte Touche Tohmatsu/World Economic Forum, April 2011, http://www.weforum.org/reports/consumption-dilemma-leverage-points-accelerating-sustainable-growth

30 per cent or more of current climate change may be linked to these kinds of pollutants as well as premature deaths of perhaps 2.5 million as a result of outdoor air pollution as well as damage to crops representing up to four per cent of current yields.

Unlike $C0_2$, which can remain in the atmosphere for centuries, these short lived climate forcers remain for just days or months—so fast action could deliver immediate benefits including in terms of reduced melting rates of ice in the Arctic and mountain ranges. [23]

These could be tackled under the formal UN climate negotiations or perhaps it may be faster and easier to address them under existing regional air quality agreements.

Ladies and Gentlemen,

Addressing climate change has become an issue that has once again has slowed in the formal negotiations to walking pace and in some cases can appear paralyzed by the politics of suspicion and finger pointing between nations.

While many countries are actually moving, it is not yet on that high level of cooperative action that ensures that the weak and the vulnerable countries are also factored part of the solution.

A measure of denial is also pervading and percolating through the public and policy arenas.

Yet, as the overwhelming science underlines, this cannot be an option if over nine billion by 2050 are to co-exist, prosper and thrive over the coming decades.

Unchecked and unaddressed climate change is likely to destabilize countries and regions, aggravating pressures and constraints already building up in a world of rising incomes, unsustainable consumption and production patterns and competing demands.

But I believe we should remain optimistic that nations will get to grips with this challenge, perhaps in large part because it is part of a wider set of sustainability challenges and sustainability opportunities emerging that are inescapable.

South Africa is looking to step up investments in solar in large part because it has done the numbers and realized that pursuing a power generation path that is based solely and simply on thermal or nuclear plants will require water for cooling simply unavailable on current supply and demand calculations.

Several major emitters are keen to reduce dependence on foreign oil and gas—energy efficiency and renewables are part of the logical options.

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[23] UNEP Press Release: Action to Curb 'Soot' and 'Smog' Pollution Could Help Limit Global Temperature Rise, June 2011: http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=2645&ArticleID=8780

Some developed and rapidly developing countries have seen the environmental but also the industrial opportunities and green job opportunities of backing wind to solar power. [24]

India may wish to cut emissions of black carbon for air quality and rural development reasons.

Kenya's restoration of the Mau forest—the largest closed canopy forest in sub Saharan Africa—has many drivers including concern for water flows to its key tourism infrastructure such as the Maasai Mara or a loss of moisture generated for its tea industry. [25]

There are also other solutions to be found when we remember that global problems like climate change are linked to many other such problems. As an example, a soon-to-be-published UNEP report says that the phase out of ozone-depleting gases between 1988 and 2010 led to a drop in annual CFC emissions from 9 gigatonnes of equivalent CO_2 to 1 gigatonne, probably the biggest reduction of any category of greenhouse gas the world has yet seen. But the report also says that the substitute for CFCs – HFCs – are ozone-friendly but also potent greenhouse gases. According to reliable scenarios, the emissions of HFCs could rise so high by 2050 that they almost completely undermine the tremendous gains for climate protection won by the CFC phase-out. However the good news is that there are already enough affordable alternatives to HFCs that the world doesn't have to go down the HFC-path.

But it is all adding up to action on climate change and might, with the right kind of leadership at the highest level and from all sectors of society take the world from a current trajectory to one that consigns climate change to the history books along with poverty and the degradation of the Earth's life support systems.

Ladies and gentlemen, in summary:

- While the formal climate negotiation process struggles, climate science continues to consolidate – with shortening timelines and escalating risk implications for the planet, its people and their economies.

- Notwithstanding the science gaps and uncertainties, we need to insure out futures through rational risk management.

- Climate actions are gaining pace across regions, sectors and actors but are insufficient to meet 2 degrees. While encouraging trends can be found in areas from renewable

[24] UNEP (2011d). UNEP Global Trends in Renewable Energy Investment 2011: Analysis in Trends and Issues in the Financing of Renewable Energy. United Nations Environment Programme, Frankfu

[25] UNEP Press Release: Multimillion Dollar Response to Mau Appeal Brings Restoration Hope to Kenya and the Region, May 2010,
http://www.unep.org/Documents.Multilingual/Default.asp?ArticleID=6549&DocumentID=624&l=en

energies, hybrid cars and improved energy efficiency to sustainable forestry and waste recycling they are still marginal to the overall emissions footprint of our global economy.

- Addressing climate change needs to be understood in broader context of reorienting our economies and delivering multiple benefits for the same investment from increased and decent job opportunities to reduced air pollution as well as a low carbon world—in short a transition towards a low carbon, resource efficient Green Economy

- A Green economy needs to be understood as relevant to developing as it is to developed countries and offers transformational policy levers applicable at the national level but also as part of a cooperative deal between nations—one thinks of phasing-down or phasing-out fossil fuel and other subsides to energy diversification; faster energy access, REDD+ and green public procurement

- The Green Economy also offers a pathway to mobilize the necessary finance and re-directing financial flows into 'the real economy'

- We also have the opportunity for an array of complementary measures from payments for ecosystems to addressing short lived climate forcers under a variety of existing agreements and initiative that can buy back time in order to achieve the 2 degree, maybe even 1.5 degree Celsius scenarios.

In short, there are a myriad of promising and forward-looking pathways away from a climate constrained world if the necessary leadership at the highest level and among governments but also business, cities and civil society can be mobilized.