



Another Planet of Opportunities, Fear and Risks¹

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The challenge of Sustainability – An ecologic, economic and social balance

A number of issues, as well as the lack of a holistic approach, are blocking a global acceptance of the concept of sustainability:

- ***The unsolved political issues***

Resource consumption and the ecologic footprint are ethical issues raised at the 1992 UN conference in Rio de Janeiro and which are measured in resource consumption per capita, whereas Global Climate Change (GCC) today is regarded as global issue. The common denominator of all three issues is that they are problems caused primarily by the industrialised countries, and that they have to be solved by the countries which created them. As the three issues are interlinked, their solution calls for a systemic and holistic approach.

From the ethical resource issue of 1992² to the question of the ecologic footprint and finally to the debate on Global Climate Change, there is an open question on the role of corporations and of politicians. In his new book *Supercapitalis*³, Prof Reich takes the view that Corporate Social Responsibility (CSR) blurs the fact that politicians have failed to live up to their promises of the past decades.

- ***The relationship between man and nature***

Descartes (1596-1650) proposed that men should become masters and owners of nature.⁴ This attitude ignores the ecologic footprint issue – which admittedly did not yet exist in Descartes days. By 2003, the surface needed to fulfill the needs for food, clothing, energy and space of one person - the ecologic footprint - corresponds to 21.9 ha of surface, but the biologic capacity of Earth is only 15.7 ha per person.⁵ Similarly to the resource consumption per capita, this footprint is much higher for industrialised countries than LDCs.

- ***The question of opportunity versus risk perception***

The precautionary principle is, like sustainability and human rights, a European invention, based on our European culture. But some wise men start to see a connection between the precautionary principle and Europe's decline in global competitiveness, such as Claude Bébéar in his article "No to the ayatollahs of prudence – let us drop the precautionary principle in the constitution, paralysing innovation and research" (*non aux ayatollahs de la prudence – il faut renoncer à la constitutionnalité du principe de*

¹ The editorial of the Risk Management Newsletter No. 41 was called "A Planet of Opportunities (and Risks)".

² See the editorial of the Risk Management Newsletter No. 40: 20 per cent of the world population consume 80 per cent of the resources (and emit 80 per cent of total man made CO₂ worldwide).

³ Robert Reich (2007) *Supercapitalism – The Transformation of Business, Democracy and Everyday Life*, 2007, Borzoi Books.

⁴ Avons-nous jamais été maîtres de la nature? Une nature à deux visages ; in: *Philosophies*, October 2007, p. 41.

⁵ Global Environment Outlook 4 Report by UNEP. <http://www.unep.org/geo/geo4>

précaution, qui paralyse l'innovation et la recherche).⁶ Competitiveness is part of sustainability, phantom risks are not.

Man-made CO₂ emissions – Another end-of-pipe waste issue?

- **Dependency**

The structure of the industrial economy is part of the problem! In Switzerland, from 1970 to 2000, GDP has increased by 50 per cent, while road transports of goods have quadrupled and road transports of people have doubled. One percent increase in GDP thus causes 7 per cent more goods transported on the road – and a similar increase of CO₂ emissions. The industrial economy is a CO₂ addict – a radical change in the economic structure from flow to stock management may be inevitable.

- **Complexity**

In contrast to the dying forests (due to SO_x emissions) and the Ozone hole (due to CFCs), GCC is not a single factor issue.⁷ But as politician shy away from complexity, and leadership is difficult in situations of uncertainty where risks are unknown, CO₂ has become the simple political issue that can be developed into a juggernaut.

- **Lessons from the past**

The waste policies of the 1990s came to conclusions that will sound quite familiar to most risk managers (*in italics*) but are ignored by CO₂-focused politicians:

- end-of-pipe solutions are economically inefficient (*prevention is cheaper than cure*),
- waste prevention has to be the political priority number one (*loss prevention avoids the invisible part of the cost iceberg*),
- waste-free solutions have to be designed into products (*risk management is not an additional coat of paint – John Kletz*).

What is the track record of the 1990s waste policies? They were never implemented, but few governments have given the reason why. An exception is Switzerland, which has stated that “effective measures to prevent waste could change or even reduce the consumption of goods. This in turn could have negative effects on economic growth, which was considered unacceptable and thus politically undesired. End-of-pipe waste strategies are considered more successful”.^{8, 9}

But is the economic truism that prevention is bad for growth – be it CO₂ from energy consumption or waste from used goods – a reality or an oxymoron? The answer depends on the observer's view: in an industrial throughput economy, the success of which is “flow” (measured in GDP), it may be true. In a sustainable economy based on “stock” (measured in wealth), it is plainly wrong. There is a clear contradiction between sustainability politics and proposed solutions: the Kyoto agreement and CO₂ sequestration are end-of-pipe approaches, not clean prevention technologies.

Prof Klaus Toepfer, former German environment minister and former head of UNEP, recently stated that the imposition of catalytic converters for automobiles (an end-of-pipe solution) had been the biggest mistake of his career.¹⁰ Yet they are still mandatory for new cars.

⁶ Claude Bébéar is President of the AXA Conseil de surveillance, and member of the Commission pour la libération de la croissance; in: *Le Monde*, Paris, vendredi 26 octobre 2007, p 22.

⁷ See the article “Time to ditch Kyoto” by Gwyn Prins, Director at the Mackinder Centre of the LSE, and Steve Rayner of the James Martin Institute of Oxford University, in *Nature*, Vol 449, 25 October 2007, p. 973 ff.

⁸ *Wirkungsvolle Massnahmen zur Vermeidung von Siedlungsabfällen hätten Veränderungen oder gar eine Verminderung des Güterkonsums zur Folge. Wegen der befürchteten dämpfenden Wirkungen auf das Wirtschaftswachstum und einer allfälligen Beeinträchtigung der Handels- und Gewerbefreiheit wurden derartige Massnahmen in der politischen Diskussion als unverhältnismässig eingestuft und nicht weiter verfolgt. Abfallverwertung und umweltverträgliche Behandlung und Ablagerung der verbleibenden Abfälle werden als erfolgversprechend weiterverfolgt.*

⁹ Abschnitt 2, Evaluation der Abfallpolitik des Bundes 1986 und 2002, BHP und Electrowatt im Auftrag des BUWAL, September 2005.

¹⁰ At the conference to present the sustainability strategy of the Land Baden-Württemberg, Staatsministerium Stuttgart, Spring 2007.

• **Lessons for insurers**

There is no lack of recommendations on what insurers should do to combat GCC (see for instance "GCC: what role for insurers? An outsider's view" on p. 15). But many of these advices neglect that the impact of GCC will greatly differ between regions with regard to warming or cooling, storm rains or droughts, food shortage or increased yield of agriculture. And insurers should not lose the overview – changes in legislation might greatly affect their business.

Is innovation into CO₂ free technologies a prevention solution?

Knowing that CO₂ takes 50 years to rise into the atmosphere, adaptation to GCC is one of the imperatives today, independently of whose fault GCC is or if it will happen.¹¹

And assuming that CO₂ is the problem, the other imperative would be to push energy savings and energy efficiency, and to foster solutions and technologies that prevent CO₂ emissions in the three main fields of fossil fuel consumption, distinguishing clearly between fossil fuels and electricity, mobility, buildings and industrial processes:

a) **Fossil fuels:** each area offers opportunities to drastically reduce CO₂ emissions from fossil fuels by specific approaches, such as:

- mobility based on hydrogen technology,
- buildings based on the concept of buildings as net producers of energy,
- industrial processes using biology and life sciences, such as coldzymes in washing processes, and cold processes such as cold resurfacing of roads.

For daily operating costs, insurers are mainly faced with the opportunities and risks linked to 'mobility' and 'buildings'. In underwriting and investments, however, they can exploit opportunities in all three areas.

b) **Electricity:** the case of CO₂ emissions from electricity production is complex and depends on the technology used: hydro energy is free of CO₂ emissions (except for the construction of the power stations), followed by nuclear power; coal-burning power stations are the worst, with brown coal worse than hard coal.

Electric trains, therefore, have extremely low CO₂ emissions in Switzerland (hydro and nuclear energy), but high CO₂ emissions in Germany (25 per cent brown coal, 25 per cent hard coal, plus a mix of other energy sources). Swiss trains produce a quarter of the CO₂ emissions of German trains, per passenger-kilometre.

The same is true for the electricity used in IT and computer centres – an area of concern for insurers. In 2004, information and communication technologies in Germany emitted 28 million tonnes of CO₂ – more than the German aviation sector! By applying best available technology (BAT), computer centres, which are the main consumers of electricity within the IT sector, could reduce CO₂ emissions and, in Germany alone, save €2.5 billion in electricity costs.¹²

- Mobility

One CO₂ free technology is to first split water into oxygen and hydrogen, and then to burn hydrogen in fuel cells to produce energy and water. Jeremy Rifkin¹³ and others¹⁴ have shown the opportunities and risks in detail – so who is afraid of hydrogen?

French engineers have produced a hydrogen fuel-cell yacht – splitting water with solar energy on the sea looks like an obvious way to propel a boat; German engineers have produced a hydrogen fuel cell submarine – a near perfect solution as a submarine can use both products from splitting water - oxygen for its crew, hydrogen for its propulsion. This could be a simple example of technology transfer from military to civil applications.

¹¹ See for instance Stehr, Klaus (2007) Klima; in; *Sueddeutsche Zeitung*, 15 september 2007.

¹² www.borderstep.de/projects/ICT

¹³ Jeremy Rifkin (2002), *The Hydrogen Economy*, Tarcher/Putnam.

¹⁴ <http://www.hydrogensociety.net/>, and <http://www.h2.ca/>

Swiss engineers have produced a hydrogen fuel-cell car which holds the world record of fuel consumption: 5'500 km per litre, or 0,02 litre per 100 kilometers.¹⁵ This car technology is comparable to the passage from transmission belts to power tools in factories hundred years ago. The petrol engine with its mechanical power train to the wheels is replaced by a hydrogen fuel cell, electric motors integrated into the wheels and wires linking the two.

Leading car manufacturers have produced a few hydrogen fuel-cell electric cars mainly to demonstrate their fears: a non-existing distribution system for hydrogen fuel.¹⁶ In industrialised countries, one of the main obstacles is the necessary investment to build a hydrogen supply network – but without hydrogen supply, no Hydrogen Economy.

So hydrogen fuel-cell electric cars are of interest to nations with a large technology base, a thirst for competitiveness but without a saturated car industry. Where might a mass-produced hydrogen car – and the necessary hydrogen distribution network - be first developed?

No points for guessing, China is the obvious answer. Of interest, however, is how China develops new products if there is no Western product to be copied. Professor Wan Gang, nominated Minister of Science and Technology of the Peoples' Republic of China in May 2007, had left China after studying engineering to get a PhD from a German technical university. With his PhD, he found a job with a major German car manufacturer, where in the mid 90s he was promoted to chief development engineer. In the late 1990s, he proposed in a letter to the Chinese government to develop a hydrogen fuel cell car. He became professor at, and later president of, Tongji University at Shanghai and fulfilled his promise – you can expect to see the result of his research on the road at the Beijing Olympics 2008.

- Buildings

The art of CO₂ free technology for buildings has been known for many years – the igloos of the Inuit as well as the underground houses of the Sahara are zero-energy houses. In moderate climates, buildings can be protected against heat and cold by insulation, louvers, and smart ventilation systems – in short, energy savings and energy efficiency.

But it is even possible to produce zero carbon buildings, which also provide the energy for their inhabitants, by exploiting for instance solar or geothermic energy (see also the article on zero carbon houses in the UK, p.14 of this newsletter). A Japanese company has been manufacturing prefabricated zero energy residential houses for some years and has recently adapted its marketing – it now sells zero energy cost houses!¹⁷

The basic tool for CO₂ free buildings is system optimisation, exploiting local heat sources including equipment and inhabitants, solar PC panels and wind turbines and avoiding heat losses and gains through appropriate technologies, such as heat exchangers or heat pumps.

- Industrial processes

The 20th century was dominated by advances in physics; the 21st will be the era of biology. Freeman J. Dyson¹⁸ is among the experts convinced that the domestication of biotechnology over the coming five decades will dominate our lives in a similar way to the domestication of computers since the 1950s.¹⁹

One practical application of biology has been enzymes in industrial processes. This method is now moving into consumer products, such as Procter & Gamble's cold-activ detergent Ariel, which is on sale in Germany, Austria and Switzerland,²⁰ saving up to 80 per cent of electricity. More results will come from current research in many countries focused bio-industries and bio-factories,²¹ replacing traditional high-temperature and high-pressure chemistry by biology.

¹⁵ Paccar 2, developed by ETH Zürich, Shell eco-competition 2006, calculated in gasoline equivalent.

¹⁶ The other reasons, stranded capital and technology lock-in, are hardly ever mentioned.

¹⁷ Sekisui Heim and Sekisui Chemical Company.

¹⁸ Freeman J. Dyson (2007), *A Many-Coloured Glass. Reflections on the Place of Life in the Universe*, University of Virginia Press 2007, 162 p.

¹⁹ Freeman J. Dyson (2007), *The Scientist as Rebel*, New York Review Books, 360 p.

²⁰ www.kalt-aktiv.de

²¹ See for instance the research financed by the Austrian Federal Ministry for Innovation, Technology and Traffic.

But the reduction of CO₂ emissions will not solve the problems if the ethic issue of resource consumption is violated nor if the ecologic footprint issue is violated! The CO₂ future promises to keep Risk Management alive and challenging.

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