

Influencing Eco Innovation

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The challenge with the notion of Sustainable Development is to define it in a way that moves practical people to find and adopt solutions on their jobs, in their households and in their community. This has proven so far difficult and slow.

Sustainable development was born in a political compromise between those concerned by the impact on the environment of the technologies and practices that support the standard of living in wealthy countries and those concerned about the possibilities for poor countries to rapidly improve the standard of living of their own people. A development that would benefit all and not damage the environment and also preserve the ability of future generations to enjoy a good standard of living in a healthy environment could be qualified as sustainable and therefore a highly desirable common goal. Proposed as a principle by the Brundtland Commission (1987 report *Our Common Future* of the World Commission on Environment and development) and embedded in the political outcome of the 1992 Earth Summit in Rio de Janeiro, sustainable development emerged as a somewhat fuzzy collective goal with a 900 pages implementation plan - Agenda 21 – but little public money to follow through and no clear priorities.

Around the same time a number of business leaders assembled in a network that brought a different perspective to the environmental debate. This debate was dominated by business-shaming campaigns following a string of severe pollution accidents like the Exxon Valdez, Bhopal, Seveso or Schweizerhalle and the obvious growth in toxic emissions and wastes as collateral effects of economic growth. Those campaigns and scientific evidence were prompting governments to ban or restrict products and impose end-of-pipe solutions. The new business network embraced the cause of sustainable development; it named itself the Business Council for Sustainable Development. Its leader, Stephan Schmidheiny, a young influential business figure, articulated the new perspective: business, as the core actor of economic wealth creation, must pursue a dual course towards economic efficiency and ecological efficiency.

This is eco-efficiency. Not a trade-off, but simultaneous progress on the environmental front *and* in profit maximization. In effect this concept is bridging the space between sustainable development, the policy principle, and business strategy. While eco-efficiency has steadily taken hold of the business and policy agenda since 1992, another message of the Business Council for Sustainable Development found mostly deaf ears in the business and the political leadership: it warned that "... eco-efficiency is not achieved by technological change alone. ... Sustainable development is also about redefining the rules of the economic game in order to move from a situation of wasteful consumption and pollution to one of conservation, and from one of privilege and protectionism to one of fair and equitable chances open to all" (Stephan Schmidheiny; *Changing Course*; The MIT Press, Cambridge, Massachusetts; 1992, p.10 & 13). Eco-efficiency must be encouraged by market signals that reflect the true cost of environmental degradation and the true value of

human health and the natural capital that ensure our prosperity. This second challenge – making markets work for sustainability – remains difficult, unpopular and, therefore, largely neglected.

Eco-efficiency – the simultaneous pursuit of economic and ecological efficiency – has been explained and illustrated by real business cases in a large number of publications, in particular by the World Business Council for Sustainable Development (www.wbcsd.org). A number of expert workshops and stakeholder dialogues framed its operational definition:

Eco-efficiency is achieved

- *by the delivery of competitively-priced goods and services*
- *that satisfy human needs and bring quality of life,*
- *while progressively reducing ecological impacts and resource intensity*
- *throughout the life-cycle*
- *to a level at least in line with the earth's estimated carrying capacity.*

As the definition is relatively long, we broke it here into its key elements. People like simple definitions and many texts will typify eco-efficiency as “creating more value with less impact”. As handy as it may seem, this is oversimplification. It overlooks its more demanding dimensions and implications. Eco-efficient products and services must compete in the market place; they must be affordable in order to produce changes and benefits. They must be designed for real needs and quality of life but not to make over-consumption more acceptable. Their design must consider impacts in the broad context of assembling the components and raw materials, but also the context of distribution and use and the disposal by consumers. This drives towards a comprehensive system assessment and improvement. Eco-efficiency also implies a precautionary approach – in the end we must cater for human needs within the capacity of our planet, we must heed the signals that we already exceed the ability of many natural cycles to regenerate. Getting to sustainable development is complex and cannot be served by a simplistic description. In many ways eco-efficiency is not a quality or end state, it is a strategy and a continuous improvement process.

This is also why eco-efficiency is not a unique recipe. Others have proposed formulations of what is required to produce progress:

Cleaner Production – promoted by the United Nations Environmental Program emphasizes resources efficiency in manufacturing and pollution prevention at the source. (www.unep.org/cp/declaration)

Material Intensity per Service – stems from the work of Professor Friederich Schmidt-Bleek at the Wuppertal Institute to analyse and quantify the resources inefficiency of our economic system. It promotes an understanding of the services and functions delivered by a product and a radical re-design to provide the same services at a lower material intensity. This dematerialization of services prompted the strategies of Factor Four to Factor 10, moving towards an economy that requires 4 to 10 times less material throughput and use in order to satisfy the needs of the world population by 2025. (www.wupperinst.org; www.rmi.org; Friederich Schmidt-Bleek, *Das MIPS-Konzept, weniger Naturverbrauch – mehr Lebensqualität durch Faktor 10*; 1998, Droemer, München; Ernst von Weizsäcker, Amory Lovins, Hunter Lovins; *Factor Vier, doppelter Wohlstand – halbierter Naturverbrauch*; 1996, Droemer Knauer, München).

Sufficiency – amplifies this notion of service. Consumer should get the performance but not the material load, the wastes and impacts that come with the product. The sufficiency approach designs highly dematerialised product-services that their providers manage in closed loops. (Independent Expert Working Group for the European Commission Research Directorate; *Sustainable Production*; 2001, published by the European Commission)

The Natural Step – insists that to reach sustainability we 1) must meet human needs worldwide, 2) cannot extract natural materials at a higher rate than nature can regenerate them, 3) disperse new substances at a higher rate than nature can break them down and 4) degrade natural resources faster than nature can replenish them. (www.naturalstep.org)

Eco-effectiveness – also promotes an alignment with natural cycles. We must eliminate from our material flows all substances that cannot be a nutrient for another material cycle or could interfere with food chains and human health. For energy we must live from the solar input. (William McDonough and Michael Braungart; *Cradle to Cradle, remaking the way we make things*; 2002, Northpoint Press)

Although their proponents may claim superiority, their approaches are rather closely related to eco-efficiency, but they amplify and enrich specific dimensions. They all outline *a transition to an economy that should serve all people in the world, now and forever, with a desirable quality of life within the limits of our planet*. Economic growth is necessary to care for the needs of a growing population that lives longer and has more aspirations beyond the satisfaction of its basic needs. But this growth must be *de-coupled* from the resulting environmental impacts.

Whether this de-coupling will be achieved through efficiency gains alone or a systematic elimination of waste materials that cannot be “nutrients” in other material cycles will be a matter of practical capability as well as choice. In face of the challenge, any combination of the various approaches will be better than inaction. In its Living Planet Report 2002 the World Wide Fund for Nature (http://www.panda.org/news_facts/publications/general/livingplanet/index.cfm) established that we now exceed, by about 20%, the capacity of the planet to regenerate its balance. According to the United Nations Development Program only one fifth of the world population enjoys a decent quality of life and the world population is due to grow by 50% in about one generation. A simplistic calculation then estimates the compounded efficiency gain to about a factor 10 in order to reduce the current environmental pressure overshoot, while caring equitably for all people as well as those to be borne in the next 25 years (or more precisely a factor of $9 = 1.2 \times 5 \times 1.5 \dots$ if one can be precise at all in this area...). In short, eco-efficiency will only get us to a stage of sustainable development if it produces on average a tenfold improvement.

Back in 1991-92 it was a group of large multinational corporations that defined and took up eco-efficiency in consultation with experts from NGOs, academia and government. Does this mean that the concept only works for big business and leaves Small and Medium Enterprises (SMEs) with a handicap? This is a frequent question. Unfortunately the familiar response - that SMEs have no time, no money and no staff for such concepts - is all too easy. And what about brains, ambition, ethics?

Let's go to a further test – could eco-efficiency work for a simple family household? Enters *La Famille Durable* (Die Familie Nachhaltig). The brainchild of Alain Chauveau, a journalist, *la Famille Durable* - two young parents, Alain and Sophie, with Amélie and Jules, their kids - was promoted in France in 2003 and 2004. The

campaign, supported by the French ministry for Environment and Sustainable Development and several private institutions, shows them exploring the best options to live a happy life while systematically reducing their environmental “footprint” (<http://www.familledurable.com/index.htm>).

They take practical steps to reduce water consumption, electricity and fuels for heating and moving. They look at what household and school supplies they should buy, how to reduce waste and noise. Many such decisions also save them some money. They become interested in product labels and start to taste foods from organic farming and fair trade. As they become more eco-efficient they do not give up comfort and pleasure; they add knowledge, creativity and fun.

The campaign also proposed a footprint calculator that enables anyone to estimate how daily habits, purchasing decisions, leisure choices build up to a footprint mostly in excess of what would be in line with the earth’s carrying capacity. Such a calculator is also available in German at <http://www.footprint.ch/>. It includes suggestions to make “gifts to the earth” in the form of resolutions to adopt a spectrum of eco-efficient habits.

Assume now that la Famille Durable also owns a small garage, or a farm or a printing business ... Would Sophie and Alain drop all their good eco-efficiency habits and thinking every time they leave the apartment and get busy with their small family enterprise? This would be a strange case of schizophrenia.

The point is: eco-efficiency is first a personal choice in a social milieu. Personal values and needs, information, understanding and financial means, infrastructure, peer pressure, public incentives and rules, all shape our individual strategies to ignore or contribute to collective issues like sustainable development.

All companies, regardless of size, are simply groups of individuals. The smaller the company, the more it reflects the spirit of its owner and employees. Most large companies today began with a single dreamer or small team with no money, but extraordinary personal energy and a passionate belief in a better world. The Body Shop, Ben and Jerry (now part of the Unilever portfolio of ice cream brands) have even built their entire growth strategy as a campaign against environmental and social harm.

*Small companies are busy and intensely focused on their survival and success. They communicate little to peripheral audiences; this why one hears so rarely about their environmental initiatives.
Here are a few exceptions that have been published as recent case studies:*

Envi-pur
www.envi-pu.cz

“We have started in a garage and now Envi-pur employs 85 people” says CEO Pavel Hnojna. At the start of the 90’ Envi-pur developed a small unit to treat domestic wastewater from kitchen, washing and sanitation in residential areas previously connected to septic tanks rather than an urban waste treatment system. Envi-Pur is a good example of a company that was entirely created on the strength of an environmental opportunity. It took a competitive position in the growing market for high quality decentralized water purification at the source of contamination. It already cooperates with a network of 12 partners internationally.

Source – Price WaterhouseCoopers; Best practices in Eco efficiency (Utrecht, May 2004)

Moritz Fiege

<http://www.moritz-fiege.de/>

As a small German family brewery Moritz Fiege enjoyed 20% growth of its 16 million euros turnover. This success is attributed to its focus on customer tastes and quality. Quality is understood in its broadest sense and includes environmental excellence. The brewery staff worked closely with the Wuppertal Institute's Sustainability assessment For Enterprises (SAFE www.wupperinst.org/safe). This generated a number of eco-efficiency projects with yearly savings exceeding 40 000 euros.

Source – Fussler et al.(eds.), *Raising the Bar*; (Greenleaf Publishing, UK, 2004)

Switcher

<http://www.switcher.com/>

A 53 million euros brand grew from the passion of Robin Cornelius who, in the early 80's launched a colourful line of cotton sweaters and T-shirts, with a strong dedication to environmental and social responsibility. It now links more than 400 fashion outlets and 400 wholesalers to the Chinese, Indian and Portuguese textile factories with a supply chain that meets clear environmental and social standards. Its commitment to transparency, continuous performance improvements and auditing has positioned Switcher as a pioneer in the textile garment sector and a favorite with customers.

Source – Fussler et al.(eds.), *Raising the Bar*; (Greenleaf Publishing, UK, 2004)

The energy, creativity and sense of belonging of the small company are not lost in the management philosophy and disciplines of the larger. Charles Handy, a long-time observer of the transformation of management realities, remarks: 'If today's corporations are going to work effectively they have to create operational units small enough for everyone to know everyone else by name.' (Charles Handy, *The Elephant and the Flea, Looking Backwards Into the Future*; 2001; (London: the Random House Group Limited) p 67) For a number of reasons, this has already happened.

For example, the big organisation with 100 or more units worldwide may indeed count a dozen of world-scale production and administrative sites, but its branch office in Quito, Ecuador or its formulating and packaging plant in Izmir, Turkey are, like most of its other sites around the world, not much different from a small company. Even sites that employ thousands of people are organised into small units and teams with a small company-like autonomy within a larger networked organisation. The reason for this small-team focus is linked to performance and competitiveness. Small teams with a strong sense of ownership are more resilient, innovative and productive; they are more responsive to their customers and to the communities in which they operate. They have the drive of a small enterprise.

Another reason for this focus is the complexity of performance tracking and management. No matter how efficient the computers that transfer and aggregate data from the company's worldwide system, someone needs to care for the water system, the clean transfer of fuels and products, avoid unnecessary lights and running idle equipment. Someone needs to address the concerns of neighbours without waiting for headquarters' reaction. The quality and eco-efficiency of the local unit are directly related to the degree of accountability and pride front-line teams have for their activity.

We have therefore to put the small-versus-big argument on its head. The drive towards eco efficiency is not the sole province of large organisations. On the contrary, it will actually show more progress when driven through the small team–small company model. Enabled by information technology, promoted by the total quality discipline and validated by business success, large companies transform themselves into what Handy calls 'federations of small enterprises'. They are simultaneously global and local, fostering a clear brand identity to bond their federation

However, there is a big difference between small teams or units operating under the umbrella of a 'great brand federation' and many small companies operating in isolation. A large corporation, as a great brand federation, equips every member of every small team with a set of policies, marching orders, targets, budgets and a help-line. Along the way, the team is given checkpoints, steering, support, trophies and encouragement. With some regrettable exceptions, most big companies with great brands operate nearly perfect internal compliance systems. When they seriously embrace a strategy like eco-efficiency it is not a voluntary, "join if you like" undertaking, but one that ensures that all employees at any site and at all levels can carry out in their local setting. And many make an effort to also align their suppliers and contractors to the same standards.

Eco-efficiency is for *all* companies of *all* sizes.

Even though large corporations present a lot of leverage directly and through their supply chains, small and medium enterprises everywhere constitute the majority of the business community (see table 2.1). It is therefore necessary to get them on an eco-efficiency course. While fully capable to adopt such a strategy they must draw on their own energy and creativity to pull together an implementation agenda. This is where access to a number of business networks, government agencies and clearinghouses becomes important: they provide specific supporting measures like conferences, trade fairs, public incentives as well as compliance controls. For Instance CSR Europe, an organisation based in Brussels to promote Corporate Social Responsibility provides a performance assessment tool with an environmental component. The tool is available on-line throughout Europe in several languages (www.smekey.org). The Wuppertal Institute produces every year, with the United Nations Environmental Programme, a calendar for small enterprises the Efficient Entrepreneur Calendar. This calendar is now evolving into an electronic diary – the SMART Entrepreneur - that leads small teams through all aspects of environmental improvement projects (www.efficient-entrepreneur.net).

Table 2.1: Main indicators of non-primary private enterprise, Europe-19, 2000

		SME				LSE	Total
		Micro	Small	Medium-sized	Total		
Number of enterprises	(1 000)	19 040	1 200	170	20 415	40	20 455
Employment	(1 000)	41 750	23 080	15 960	80 790	40 960	121 750
Occupied persons per enterprise		2	20	95	4	1 020	6
Turnover per enterprise	Million €	0.2	3.0	24.0	0.6	255.0	1.1
Share of exports in turnover	%	7	14	17	13	21	17
Value added per occupied person	€ 1 000	40	75	105	65	115	80
Share of labour costs in value added	%	66	66	58	63	49	56

Source: Estimated by EIM Business & Policy Research; estimates based on Eurostat's SME Database. Also based on European Economy, Supplement A, June 2001 and OECD: Economic Outlook, No. 65, June 2001.

Companies embark on an eco-efficiency strategy for one of two main reasons: They either have no other choice or they want to.

The first case can even be a state of crisis like the rapid ban of ozone depleting substances that pushed their users to redesign their equipment and reformulate their products under a relatively short mandatory timetable. More often it is a strong pressure coming from government signals, like the European Air Quality or Urban Waste Water directives, which stimulate process changes. Most carmakers today strain to agree to a more stringent carbon dioxide emission limit (a fleet average of 120mg CO₂/km) that would support the European Union climate change policy.

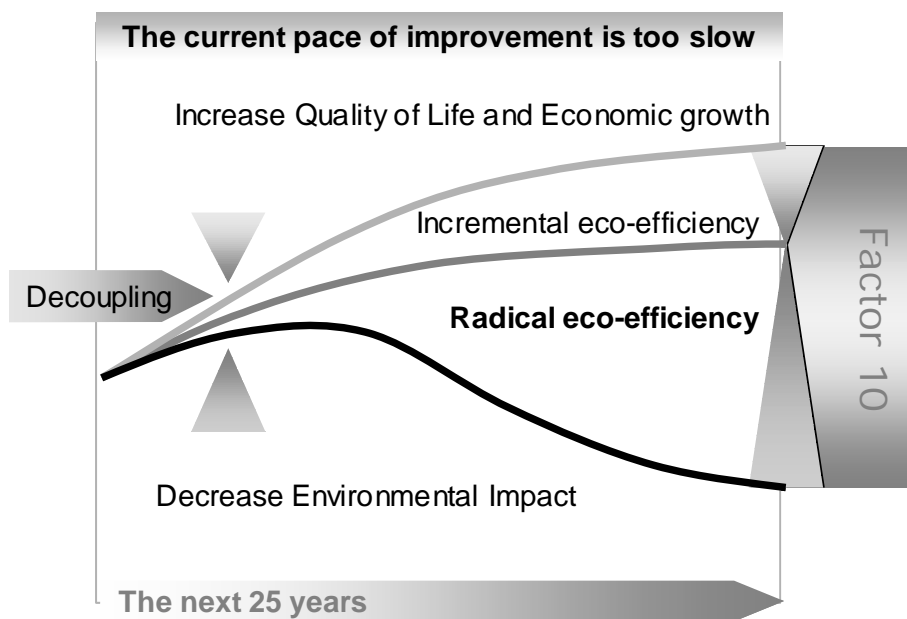
On the other hand Toyota aggressively promotes the Prius, its hybrid motor vehicle that switches to electricity to emit no CO₂ in urban driving and achieves 104mg CO₂/km when it runs its gasoline engine. This is the result of focused innovation that anticipated the need for low emission vehicles years ago. Another example of a proactive approach to eco-efficient transport is the Swiss company Mobility (<http://www.mobility.ch/>). This small enterprise perfected since 1997 the convenience and economy of the car sharing system. It has 58 000 drivers sharing 1700 cars closely located to intercity train stations across Switzerland. This significantly decouples mobility from its material, space and energy burdens while providing choice and performance to the customers. <note to editor: the example of DBRent could feature here in place of Mobility>.

Most often we have reactive eco-efficiency development by companies. They accept change when it saves or maintains their license to operate. Typically they get no credit for the improvement despite the real effort and costs involved; only those who raised the issue and campaigned for change may get the public recognition.

But, some companies are taking a longer view: they have recognized a number of environmental pressures and social needs that are inescapable. They see the opportunity to provide solutions rather than taking the risk to amplify the problems. Since 1996 the German chemical giant BASF has thus made eco-efficiency one of its strategic decision models. (<http://www.sustainability.basf.com/en/sustainability/oekoeffizienz>). Its chairman, Dr. Jürgen Strube puts it in context: “A corporation must not live off its capital. It must not deplete its own resources, or the resources of the environment or of society”. Eco-efficiency then “...is a good example of how well measures that are not regulated by government, but rather voluntary measures, can help create a balance between sustainable development and profitable growth”. (Lecture at Keidaren kaiken, Tokyo oct. 28, 2002).

While we have two contrasting classes of eco-efficiency – the pressure/crisis class opposed to the foresight/vision class – we also have two major modes – the incremental and the radical. We can see evidence of incremental eco-efficiency in a number of regional indicators published by the European Environmental Agency (www.eea.eu.int) and the UN Environmental Programme (www.unep.org/geo3). For instance, in the European Union Gross Domestic Product increased by 16% from 1995 to 2001 but total energy consumption and packaging waste only increased by 7%, direct material consumption remained practically constant and water abstraction even decreased. These are positive signals that economic growth can be de-coupled from environmental impacts. Many industries and companies also show a similar pattern that can be read from their environmental performance publications – output and sales increase faster than the use of resources and the emission of waste. This is due to progress in eco-efficient practices and technology. However all too often the de-coupling is only relative. Environmental impacts are still growing, only at a slower rate. As passenger transport increases roughly at the same rate as GDP all efforts made so far by car manufacturers to curb carbon dioxide emissions through fuel efficiency are cancelled by the increase in traffic. The outlook is better for particulates, ozone precursors and acidifying substances where strict emission standards obtained absolute de-coupling. One should not underestimate the creativity and dedication to innovation that underlies even relative de-coupling. But on the whole, even though Europe stands out in the world as most successful in slowing down environmental impacts, this pace of change is too slow to create a model of quality of life that all people could enjoy without threatening the sustainability of our natural life support systems. (fig 1)

Fig 1



If one accepts the hypothesis that the resource efficiency of our economy, to establish sustainable conditions, must reach a ten-fold improvement, we could only get there by a number of radical innovations. An example is the innovation trajectory of white light sources. The conventional dominant technology heats a filament of tungsten to incandescence and wastes about 95% of the energy as heat while the tungsten filament evaporates slowly and breaks up after about 1000 hours. Since the 80' compact fluorescent light bulbs, which excite a metal vapour to emit light in a near vacuum, provide increased durability and a five-fold energy efficiency gain, albeit at the expense of mercury content and a disposal problem. The newest technology builds on the property of certain composite structures of semiconductors to emit light. Driven by a number of technology ventures Light Emitting Diodes (LEDs) already rival the light output of small halogen sources at a tenth of the energy input and years of increased service life. On the basis of their small size and portability they started to penetrate the applications of traffic signals, medical lighting and small light torches. They will contend market position on the strength of radical eco-efficiency: outstanding energy-to-light conversion, extreme durability, compact design and packaging and harmless materials...

Convincing examples of a similar array of radical eco-efficiency advantages like in LEDs are rather hard to find. One could put forward the material efficiency and reliability of acoustic imaging and endoscopic surgery in the medical field, wireless telephony and teleworking for communication and mobility, catalysis in the polymer and specialty chemicals design and production field, hydrogen and bio-fuels as new energy carriers...

To accelerate the transition towards radical eco-efficiency the Dutch government initiated its Sustainable Technology Development programme in 1989. This programme explored how a set of basic human needs – nutrition, mobility, housing, offices and urban space, water services, materials and chemicals services – could exceed a ten-fold eco-efficiency improvement in the time span of two generations. Sustainable Technology Development programme is exemplary in many ways. It strongly promoted and relied on a social dialogue to identify desired visions and

pathways to a sustainable situation beyond the current generation. It pushed for breakthrough approaches in “backcasting” the technology options and innovation trajectories to realise the visions. It fostered system and life cycle thinking while promoting interdisciplinary cooperation. It involved business in specific case studies and network projects with the research community, civil society and government participants. It also associated public authorities in the evaluation of appropriate policies that would support the commercial success of the solutions pursued in the case studies. (Weaver, P. L. Jansen et al. *Sustainable Technology Development*; Greenleaf Publishing, Sheffield, UK; 2000 - Schramm E./P. Wehling (1998): *Forschungspolitik für eine nachhaltige Entwicklung: Das niederländische DTO-Programm und seine Bedeutung für die Bundesrepublik Deutschland*. ISOE-Studientext 5 - <http://www.isoe.de/english/projects/dto.htm>).

The Sustainable Technology Development programme spun off a number of innovation projects and ventures that continue to this date in industry and research institutes. Its major merit was to establish that most sustainability challenges could be met through a combination of possible technologies and social behaviours. Often the solutions are inspired from nature and its metabolism or directly call on microorganisms and enzymes to reach the desired level of eco-efficiency. Nature indeed is a model of efficiency. The firefly produced cold light eons before man mastered fire. The silk worm still holds the record for the longest (2 km) and best strength-to-weight performance polymer chain, produced at ambient temperature from leafs and air, at speeds that have met the needs for cloths and fabrics for about 3 500 years. The Sustainable Technology Development programme also established that it is possible to focus and accelerate the innovation process towards dramatic eco-efficiency by a smart combination of existing methodologies. But this also implies another obvious lesson: that there must be a will and a managerial competence in action to produce meaningful change. Radical innovation towards eco-efficiency is hardly ever a spontaneous process. Not surprising then that it is so hard to find convincing examples.

Even radical eco-efficiency examples may not have radical benefits. Let’s look at the example of the energy efficient light bulb again. The Compact Florescent Light is now widely available, a factor 5 eco-efficiency that has reached mass-market status in the last 10 years. Yet it has only captured 6% of the market despite of its energy saving advantage and long service life. Institutional buyers who are sensitive to their energy bill and the manpower costs to replace light bulbs prefer the new technology. But the large consumer market is shy of its high price tag even though the payback in energy savings is slightly shorter than the expected life of the high-energy and low-cost traditional filament bulb (table 2). When it comes to replace a bulb every couple of years electricity prices are perceived as negligible compared to the lamp’s price. Consumers with this flawed economic perception, turn a radical eco-efficiency development into an incremental solution.

Table 2	Compact Fluorescent Light	Filament light
Power rating in watts	20	100
Service life in hours	12 000	1000
Unit purchase price in €	12.70	0,50
Electricity price €/kwh	0.154	0.154
Energy cost during 12 000 hours	36.96	184.80
Lamp renewal costs		5.50
Total 12 000 hours costs in €	49.66	190.30
Total 12 000 hours saving in €	140.64	
Breakeven time in hours		990
Share of European market in %	6	66

The European Lamp Companies Federation (www.elcfed.org) evaluated the magnitude of the opportunity. In a recent working paper it estimates that a switch of 36% of the installed 1.6 billion conventional filament bulbs to compact fluorescent bulbs would save 26.6 terawatt-hours per year. This is more than the total yearly electricity consumption of Ireland or nearly 1% of the total electricity consumed in Europe. With the leverage of such a simple substitution one can then wonder what institutional arrangement could bring it about? Could electrical utilities see here that it is not a matter of lost kWh sales but an avoidance of capital spending on generation capacity, particularly this expensive capacity of “green electricity”? (Electricity not used is greener than any other kind). In face of the cost of nearly 600 million low energy lights what is it worth to the community to avoid the 11 million tons of carbon dioxide those lights could save every year? Obviously, the market on its own, has not favoured the low energy lighting solution. Should governments and industry cooperate to change the signals? And how?

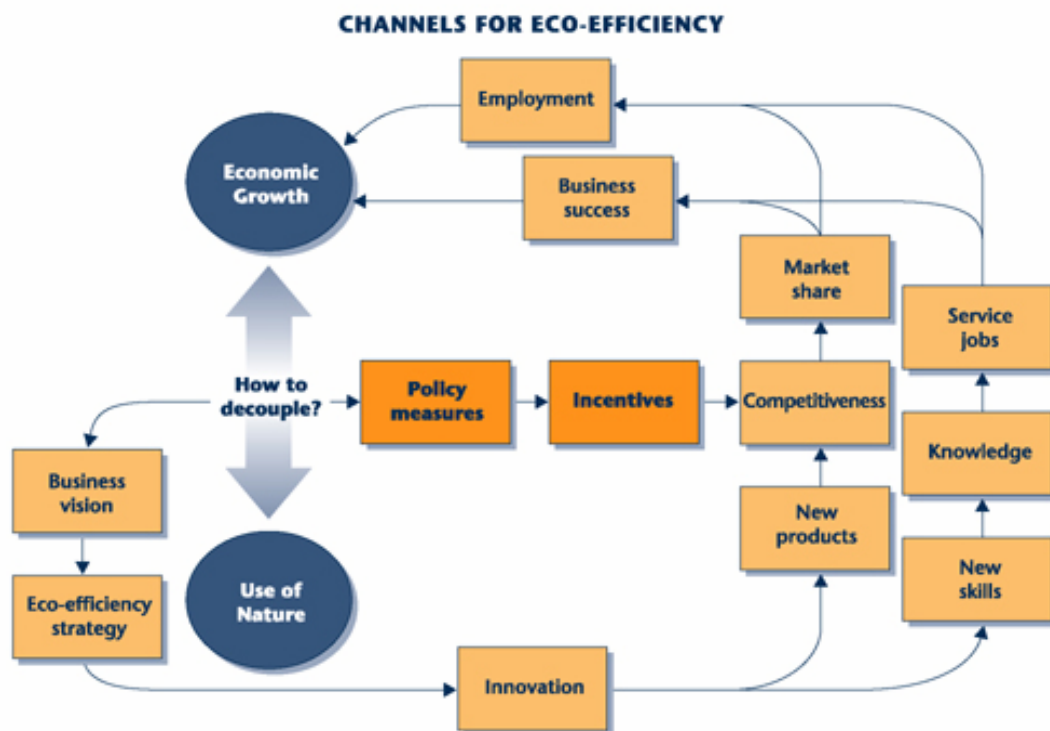
The discourse of “radical eco-efficiency by foresight” and breakthrough innovation is appealing. This is where business should be according to countless workshops and reports; they articulate the business case for proactive engagement that seeks win-win solutions and competitive advantage in sustainability. Who wants to wait for crisis to change? Who wants to admit to tedious, slow and small innovations? Not leaders of notorious brands. And yet for all the statements of leadership in principles and responsibility towards the planet and society, the evidence in all OECD countries seems to favour the pressure scenario: significant progress in resolving urgent environmental problems and de-coupling economic growth from particular environmental impacts is, so far, the result from legislative action or clear public policy direction supported by economic instruments. Take stratospheric ozone depleters, lead in gasoline, sulphur dioxide, industrial toxic releases, or groundwater and urban air quality. With a host of other environmental successes they were initiated by environmentalists and scientists, supported by public opinion and driven by determined governments.

It did help, that based on foresight, DuPont took sides for the Montreal Protocol with production-ready substitutes for the substances to be phased out, or that a number of chemical leaders designed the Responsible Care initiative to increase product stewardship. As it helps today that Toyota or Volkswagen take the lead in promoting road-ready low CO₂ vehicles or that a number of large energy producers and users started voluntary CO₂ trading schemes in anticipation of a regulated market to support the Kyoto targets. Lets’ also recognise that more and more multinational

companies avoid double standards; they demand that their foreign subsidiaries and partners meet a level of safety, social and environmental performance that is at least in line with the standard in their home base. By taking voluntary action to disseminate good practices and technologies they contribute to progress and eco-efficiency even in absence of functioning institutions.

The paradox is that voluntary action alone cannot have real impact without public policy initiatives to mainstream the innovations. Likewise, public policy alone cannot mandate solutions to the complex sustainability issues before some pioneers actually develop those solutions. Innovation cannot be legislated. But it can be given policy direction and challenges, public grants and access to basic public research. Innovators can get the assurance of green public procurement contracts and support for market development while users of obsolete technologies can be given notice to up-grade or be penalized. Governments have a range of instruments to jump start eco-efficient innovations and, once they have proven their worth, influence the market in their favour. Eco-efficiency progress needs a creative interplay between business vision and initiative and government policy that intervenes to support the competitiveness of eco-efficient innovations. This creates the wider conditions of success both in the environmental field and in the social field where new skills and employment opportunities are strengthening the economy at large. (Fig 2)

Fig 2 - source: WBCSD, *Eco efficiency*; p. 24 the policy agenda Geneva 2000



For this to happen business leaders and spokespersons may have to think through what they really mean by their rhetoric of voluntary measures and initiatives. If voluntary means the free choice between action and no action we are not going to have eco efficiency and sustainability for a long time or only through crisis. Because if voluntary action is based on a few responsible business people's foresight of risks and opportunities, what is it that will compel the mainstream of their sector or their customers and consumers to also join and contribute to the initiative? Unless this

happens the few leaders may stand out a while for praise and goodwill, but they will achieve no tangible change and may well end up confronted with a backlash of credibility. The more so when their pledge for voluntary action only helped to diffuse some imminent government proposal. Only sector wide action, with critical mass and stakeholder involvement, like the Cement Sustainability Initiative or the Sustainable Mobility project coordinated by the World Business Council for Sustainable Development, (www.wbcsd.org) are credible models for voluntary initiatives.

“... Eco-efficiency is not achieved by technological change alone. ... Sustainable development is also about redefining the rules of the economic game in order to move from a situation of wasteful consumption and pollution to one of conservation, and from one of privilege and protectionism to one of fair and equitable chances open to all”. This is as true today as when it was declared in 1992 by the small group of business leaders who put eco-efficiency into the management and policy vocabulary.

Technology is actually the least of the problems. It is social and policy innovation that is the hardest. Because it requires that business initiatives respond and actually give time from the start to a policy dialogue that formulates shared priorities and objectives. It is also a shared undertaking to design the set of policy instruments to stimulate eco-efficiency development and reward its developers and early adopters. This is tricky because it will shake up the status quo. We have accommodated ourselves with imperfect market signals and with our habits to ignore and externalise the costs of many environmental and social goods. Who will lose or win in the shake up? This uncertainty stifles action and penalizes the innovators. If we are to benefit from current eco efficient solutions and foster a new wave of innovation we must eliminate the chronic flaws of the market that encourage our economy to abuse of its natural resources.