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Content

COLOPHON

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Waste not, want not

What's dominated the news just recently? Steadily rising energy prices and the costs of the products on services that depend on them. Some economic sectors, like transport and horticulture, are finding themselves in difficulties as a result.

At the same time, there is a growing understanding worldwide that the environmental problem – especially global warming and pollution – is actually rather serious and that it's essential to take account of what our planet can put up with. Climate conferences and treaties, like the Kyoto Agreement, put these issues high up on the political agenda a long time ago, but latterly businesses have taken them up as well.

After all, high fuel prices have seen environmentally friendly alternatives become economically viable. So many companies have moved fast to incorporate ecological innovation, such as clean technology, into their products and services in the hope that by doing this they might gain a competitive edge over those of their rivals who are still stuck in their old ways. The result? Creative destruction in practice, and a new industrial revolution in the making.

The new combination of environmental friendliness (both in the industrialised world and developing countries), corporate and social involvement (e.g. by making stakeholders accountable) and attaching importance to the efforts and contributions made by all parties (including industry, science, government authorities, pressure groups and individual citizens) is subsumed by the all-encompassing qualifier 'sustainable'. For this very reason, this EWI Review focuses on the issue of sustainability. 'Sustainable' and 'sustainability' have become labels that are used in a very wide range of (sometimes extremely different) contexts and situations.

The contributions to this EWI Review reflect the diversity of angles of attack and approaches. The Union of Independent Entrepreneurs (UNIZO) argues that SMEs are sustainable almost by definition (see p. 32). We discuss the European Union's new sustainable climate plan with one of the people who helped to draw it up (see p. 37). Companies outline how they do business sustainably (see pp. 14 and 43) and a few of the measures taken by the Flemish government to stimulate sustainable development are also covered (see pp. 12, 31 and 42).

But we aren't forgetting our 'classics' either, so present yet another policy research centre, this time for sustainable development (see p. 40). We also take a look at the Flemish Institute for Technological Research (VITO) as a research organisation (p. 23) and scrutinise the results of the VISION Era-Net project (see pp. 6, 46 and 48).

I would also like to draw your attention to a new EWI book, entitled *Building a Sustainable Economy: Investing in the Future*. In it, various prominent figures from the business world explain how in practice, together with knowledge institutions and in dialogue with the government, they set about rising to the challenges and opportunities of a sustainable economy. Copies of the book can be ordered from www.ewi-vlaanderen.be.

I hope this EWI Review gives its readers sustained pleasure!

Peter Spyns,
Editor-in-Chief

How to deal with the ageing of government personnel?

The media are constantly reminding us that there can be no ignoring demographic ageing. In offices everywhere, there is growing awareness that the ageing of staff will throw down challenges that must not be underestimated. Government institutions, too, which grew in the 1970s following the expansion of the services they provided and thus hired large numbers of 'baby boomers', are noticing the impact of a demographic shift. In fact, within the next few years there will be a massive exodus as experienced staff at the federal, Flemish and local levels take retirement.

A general demographic analysis shows that over half of all Flemish officials are aged 45 or older. Roughly one in every five members of staff are at least 55 years old. Bearing in mind the average retirement age of 60, this means that within the next five years, 20% of Flemish officials are set to retire. Two years further down the line, these percentages will become even higher. These are also the kinds of figures that federal government institutions are facing. Local administrations are somewhat 'younger', though here again demographic ageing is clearly an issue as well.

Spotlight on the challenge

The question that organisations in both the public and private sectors are asking is how to face up to this demographic challenge. Their loss of knowledgeable, experienced staff and the current shortage of available replacements is prompting government organisations to keep their staff versatile and motivated for as long as possible. At the same time, government institutions are also wondering how best to tailor their service provision to the changing needs of an ageing society.

Extensive scientific research needs to come up with answers to these questions. In 2004, the Policy Research Centre on Governmental Organisation in Flanders, (SBOV I)[1] launched a two-year research project (2004-2006) focusing on how to conduct an age-conscious personnel policy (known in Flemish by the acronym LBPB). This project affords us an insight into the ageing of the Flemish government's staff and ways in which it can keep its staff versatile and motivated.

The philosophy of an age-conscious personnel policy entails taking account of staff members' changing needs and desires throughout their career. Irrespective of the terms actually used to describe the phenomenon (age-conscious, age-aware, sustainable personnel policy, etc.), the core message is the same: Firstly, employers have to play to the individual characteristics of every staff member, whether young or old; and secondly they have to make sure

staff remain versatile throughout their entire career.

The next question is how to achieve this in practice within an organisation like the Flemish government. Based on a wide range of models, we drew up a conceptual framework that includes the most typical and elementary components of an LBPB (Vanmullem and Hondeghem, 2005). We then set these elements within the personnel policy's inflow, through-flow and outflow pattern and pinpointed five crucial success factors that underpin it.

Having said that, there is no single age-conscious personnel policy. Indeed, the contents of such a policy will largely hinge on specific organisational factors and thus vary from organisation to organisation.

Key factors

Here are some of the important elements:

- The tight labour market situation is making it ever more important to target recruitment more effectively. Hiring fresh graduates is no longer sufficient to fill all vacancies, and at the same time the recruitment of experienced individuals necessitates a different approach with regard to the description of vacancies, the channels used to recruit candidates, the selection procedure and the conditions offered. For both young and experienced candidates, the government's attractiveness as an employer also plays a major role.
- All too often, training (of whatever kind) is neglected during the latter half of people's careers, yet various studies show that staff continue to deem on-the-job learning important throughout their working life. In practice, staff participation in training during the second half of their career is often low, and much too frequently the conclusion drawn from this is that the individuals in question are no longer motivated. However, reasons for this should also be sought outside the individual by asking whether older staff are still being actively encouraged to learn. Is the training on offer geared to the needs and desires of people who already have some experience? Quite apart from the age factor, staff do their learning in different places, at different times and in numerous different ways. It is crucial to be mindful of such individual differences and give people opportunities to adopt their own approach (Baert et al 2007).
- Versatility is enhanced by mobility. Switching someone's job or changing their duties creates new challenges that foster flexibility. The all-too familiar assumption made even today is that horizontal organisations offer too few opportunities for this, with people thinking primarily in terms of promotion. Yet the true scope of job enrichment or job rotation is broader than this, extending to taking on other tasks within the same job or taking up another post either within the same department or in a different one.
- An individually tailored, organisational career management policy underpins the gearing of staff member's needs and desires to the opportunities that the organisation in question has to offer. Regular consultation and clear communication about the openings and prospects available within the respective organisation encourage staff to continue developing throughout their career.
- Staff mobility and retirements on a massive scale also result in a serious loss of knowledge. Having said that, conserving knowledge entails more than assigning departing staff members to put down on paper the knowledge they have acquired. The important questions are as follows. What kind of knowledge is essential for the organisation? How should it be gathered and passed on? There are various possible answers, and the process itself can benefit both the organisation in question, which thus retains its know-how, and their staff, who gain recognition for the knowledge they have acquired and for their performance.

Very little research has been done on the management's role in stimulating and motivating staff. Older staff in particular seem to be sensitive to the management style adopted by their immediate superior. The fact is, any individuals subjected to a management style that is strongly individually geared towards them experience their job in a more positive light. The potency of this effect increases with age, hence the importance of ensuring that managers support their staff during their career, especially during its latter half. Solid support from the managers of staff members' immediate superiors is also important (Vanmullem and Hondeghem, 2007).

The follow-up study

SBOV II (2007-2011) marks a continuation of our quest to find more ways of dealing with the ageing problem. We are looking into how the adopted approach impacts on government personnel at the macro, meso and micro levels, focusing on local administrations, since too little research is being done in this domain.

In 2007, we considered the macro level, whereby the issue of pension affordability loomed large. The report on this, which was based on the study of documents and interviews conducted with various actors, constitutes one contribution to the general debate about pensions, clarifying the situation within local administrations and providing pointers about which policies can keep us on track towards ensuring that pensions remain as affordable as possible in future.

The spotlight in 2008 is on the phenomenon of ageing at the level of the organisation (the 'meso' level). Does personnel policy need to change? What openings does that policy leave for implementing creative measures? We hope to find the answers to these questions by conducting a survey among all Flemish local administrations. The last level, the 'micro level', constitutes individual staff themselves, where the focus will be on ascertaining how people view their careers and gathering their opinions on versatility and motivation.

Kathleen Vanmullem and Annie Hondeghem, Policy Research Centre on Governmental Organisation in Flanders (SBOV)

1 See EWI Review (2) 1: 44 – 46.

Literature

- Baert Herman, Hondeghem Annie, Van Bree Leen & Vanmullem Kathleen (2007). *Werknemers in de tweede helft* (Staff during the second half of their career).
- *Werkhypothesen voor leerparticipatie en leerbeleid* (Working hypotheses for participation in learning and learning policy). *Develop*. 3: 7-17.
- Vanmullem Kathleen. & Hondeghem Annie (2005). *Een leeftijdsbewust personeelsbeleid bij de Vlaamse overheid: stand van zaken binnen het Ministerie van de Vlaamse Gemeenschap*. (An age-conscious personnel policy for the Flemish government: the current situation at the Ministry of the Flemish Community). Leuven: SBOV. 62 p.
- Vanmullem Kathleen & Hondeghem Annie (2007) *Motivatie en leiderschap. Casestudie van een Vlaamse overheidsorganisatie*. (Motivation and leadership. Case study of a Flemish government organisation). Leuven: SBOV. 125 p.

Want to know more?

How relevant is this research to actual policy? It brings suggestions and inspiring input on the kind of policy that can optimise staff motivation and versatility at all periods of their life. We share the results of such research in various publications, at seminars and in workshops. To find out more, see **www.steunpuntbov.be**.

Ten tips for a dynamic innovation policy

Recently we published our final report on the VISION Era-Net project[2], entitled "Major challenges for the governance or national research and innovation policies in small European countries". Ten European countries and regions, including Flanders, took part in this project, aimed at analysing and comparing recent developments in the management of the science and innovation system[3]. In this connection, 'governance' refers to the systems and practices used in the policy on science, technology and innovation (STI) to set priorities, decide on any practical implementation and gain insight into the policy's impact and effectiveness.

In most countries, STI policy is 'horizontalised' in one way or another and STI policy not only aims to achieve scientific excellence and economic growth, but is also actively used to cover all kinds of social issues. In practice, this means that more actors, departments and social organisations are involved in the STI system and how it is run. The study cited above provides an insight into how the ten countries in question deal with this ever more complex running of STI and teaches us some important policy lessons.

The study was conducted by two research and consultancy specialists, the Finnish Gaia Group Oy[4] and the Dutch outfit Dialogic Innovatie & Interactie[5], between August 2007 and April 2008 and comprised a combination of desk research, almost 30 case studies examining how recent changes in STI policy management came about and what prompted them, and a questionnaire sent out to respondents directly involved in STI policy. The questions in the latter were primarily designed to identify issues of importance to future STI policy and determine how it is being conducted. The provisional results were discussed in national workshops and at the VISION Era-Net conference held in Stockholm on 16-17 April 2008[6].

In all, the report reached 10 main conclusions.

1. In all countries there is a trend towards more horizontal, open, tailor-made solutions in the STI policy domain. The participating countries are currently at various stages of the process of change and of coping with the issues raised in their own characteristic manner. Virtually everywhere, the transition is being viewed as an opportunity to subject the form and management of STI policy up to critical evaluation.
2. STI policy has evolved into a fully developed, established policy domain. With many budgets rising steadily and STI often figuring high on the political agenda, it is perfectly legitimate to ask the question: "So what are we getting out of all this?". As things stand, existing systems seem incapable of facing up to the challenges of a broader STI policy and/or of recasting themselves to a sufficient extent.
3. Changes in STI management aren't entirely rational and can't be viewed separately from the political culture of a country or region. The cultures in question may differ, but in practice we can distinguish two complementary modes. Formal, hierarchical top-down management is complemented by more informal, network-based and more bottom-up approaches. Countries that – sometimes through no choice of their own – place more confidence in the latter method are not necessarily less effective when it comes to how their STI system is run.
4. Considerable strategic intelligence in the management system is required for the formulation and implementation of a coherent, broadened national STI strategy. This does not automatically mean that an all-encompassing STI strategy is what is required.
5. New challenges in the STI domain call for experiments with interorganisational and interdepartemental forms of management and coordination. Various factors are identified as suitable vehicles for successfully creating a coordinated, coherent STI policy.
6. There is mounting pressure to strengthen the knowledge base underlying STI policy. New, more innovative, but also riskier system management approaches are required. These go hand in hand with a trend towards 'evidence-based' policymaking[7] and are not necessarily incompatible with the growing need for accountability.
7. In practice, windows of opportunity regularly arise, offering chances to change how the STI system is managed. It is essential to exploit the natural rhythm with which such opportunities crop up and to use the time between any such pivotal moments to work out the details.
8. Achieving a balanced system of STI management entails walking a fine line between consultancy drawing up policy and then implementing the relevant measures. At the same time, the system must be self-critical enough and sufficiently capable of learning to be able to effect any necessary policy shifts in good time.
9. If an STI policy is to be applied widely, it is also vital to find new ways of involving stakeholders.
10. The debate about how to manage the STI system must be conducted in good time, not just when a serious crisis arises.

Pim den Hertog and Robbin te Velde, Dialogic NV, the Netherlands

EWI provided the Flemish input to the VISION Era-Net project. As well as taking part in the steering committee, in consultation with advisors we reported on three Flemish case studies, namely:

- that the establishment of EWI and its impact on relations with respect to the management of the Flemish STI system;
- the change in the structure of governance regarding STI, by broadening the range of tasks covered by the Flemish Science Policy Council (VRWB);
- the implementation of a code of good governance for strategic research councils.

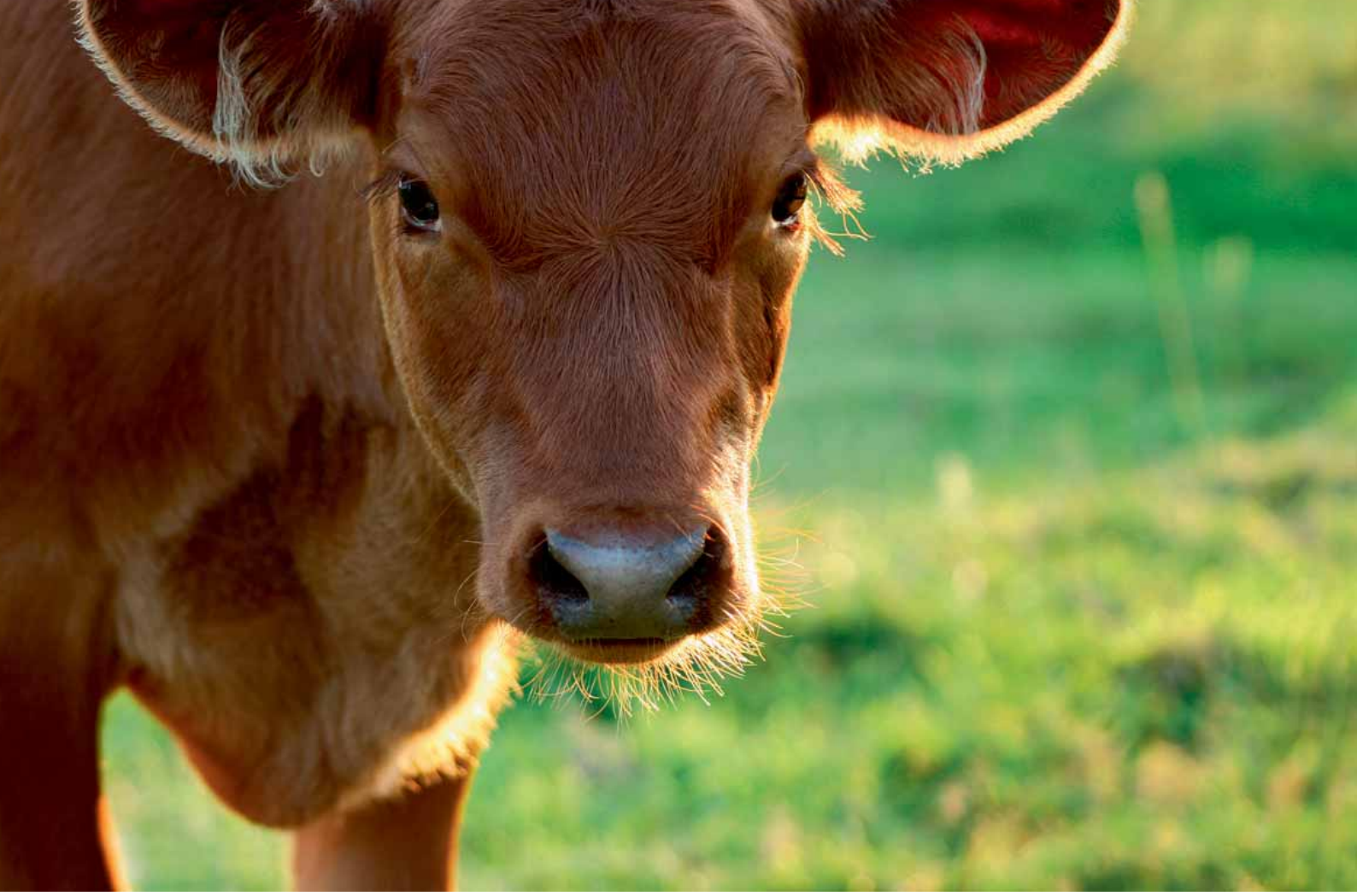
At the same time, EWI offered its assistance in identifying participants for the Internet survey. We organised a workshop where the provisional results were discussed, focusing on how stakeholders are now involved in the new, extended STI policy, the forms that interdepartemental cooperation does and can take, and the question of whether the Flemish STI system lacks a 'director'. As such, the debate seems to follow on directly from the opinion issued by the Soete Committee on the form taken by the Flemish system of innovation.

VISION ERA•NET
SHARED KNOWLEDGE BASES FOR SUSTAINABLE INNOVATION POLICIES

Want to know more?

The final report of the study is available at **http://www.visioneranet.org/index.phtml?s=64**.
In addition, the VISION Era-Net website contains presentations, including more detailed country presentations. For further information, send an e-mail to Peter.Spyns@ewi.vlaanderen.be .

2 See EWI Review (2) 1: 24.
3 See EWI Review (1) 1: 10 – 13.
4 www.gaia.fi.
5 www.dialogic.nl.
6 http://www.visioneranet.org/?84_m=241&s=10.
7 Preparing and conducting policy based on objective data and scientific insight.



Innovation in Flemish agriculture and horticulture

Innovation is tremendously important for the development of agriculture and horticulture in Flanders because it ensures that competitiveness is maintained and enhanced. It also serves as a way of rising to all kinds of social challenges related to the environment, animal welfare, food safety, traceability, quality and the landscape.

The study entitled *"Innovatie in land- en tuinbouw in Vlaanderen: resultaten van het Landbouwmonitoringsnetwerk"* (Innovation in Agriculture and Horticulture in Flanders: Results of the Farm Accountancy Data Network) presented the findings of a survey conducted among 715 agricultural and horticultural companies belonging to the Farm Accountancy Data Network. This is the bookkeeping network managed by the Division for Agricultural Policy Analysis of the Department of Agriculture and Fisheries.

One aim of the survey was to ascertain just how innovative the various sectors of agriculture and horticulture are, the forms that innovation takes, who is involved in it, and what makes people decide whether or not to innovate in the first place. Another aim was to find out whether there is a link between a number of farm and farmer characteristics and innovation.

For the purposes of the survey, the term 'innovation' was taken to mean any new departure by a farm, i.e. not necessarily innovation at the sectoral level. This meant that the introduction and adoption of innovations via the process of diffusion also counted.

Who innovates?

Table 1 shows the percentage of farmers per type of farm who innovated between 2002 and 2006. Horticulture (45%) in general, and ornamental plant cultivation (54%) in particular, are the most innovative, followed by pig breeding (37%). Cattle farming, including dairy farming, scored lowest (19%). Arable farming (27%) and mixed farming (28%) scored in between. Within mixed farming, farms with combinations of stock breeding scored highest (31%), followed by arable farms raising pigs (29%) and arable farms raising cattle (24%).

Arable farming	Horticulture	Cattle farming	Pig farming	Mixed farming
27 %	45 %	19 %	37 %	28 %

Table 1: The percentage of farmers claiming to have innovated over the last five years (2002-2006), per type of farm

As well as the type of farm, its size, the age of the farmer and the succession situation all strongly affect innovation. Larger farms and younger farmers innovate more, as do older farmers (above the age of 55) who have a successor.

In addition to determining the number of innovations, the survey also looked at the extent of innovation per type of farm, i.e. the percentage of farmers who had innovated. To that end, farmers were divided into four degressive categories of innovator, being classed either as 'one of the first to innovate' or one of 'fewer than 5% who have already introduced that innovation', '5 to 25%' or 'more than 25%'. 30% of the respondents claimed to be among the first to innovate. These are the so-called 'pioneers'. 22% and 21% respectively answered that fewer than 5% or 5-25% of their colleagues had already introduced that particular innovation. These constitute the 'quick followers'. Approximately 28% of farmers, whom we can describe as 'stragglers', said that more than 25% of their colleagues had already introduced that innovation.

What forms does innovation take?

The literature on the subject distinguishes four kinds of innovation: product innovation, market innovation, process innovation and organisational innovation. Table 2 provides an overview of a number of innovations depending on the type of farm involved. Underlined innovations reflect a trend. An analysis of the type of innovation shows that most do not entail entirely new departures for the sector, but rather follow from the introduction of something new at the level of the farm. Innovations that are new to the sector as a whole are very few and far between, occurring at a limited number of farms. Extensive analysis of these would first require the conducting of a specifically targeted survey.

A number of innovations are in one way or another aimed at boosting sustainability. The economic and ecological dimensions of sustainability score particularly high, the social dimension less so.

- A number of process innovations lessen negative impact on the environment,

Table 2: Type of innovation per farm type (underlined innovations are tendential)

	Product-related	Process-related	Market-related	Organisational
Arable farming	rapeseed cultivation and/or pressing, care farm	mechanical weed eradication, pesticide reduction	sale of own produce	-
Horticulture				
fruit	new varieties and/or plants	cold stores and fridges, hail-control gun, weather, station, improved picking methods, fruit sorting in water	vending machine selling fruit and fruit snacks, home sales	-
vegetables	new varieties and/or crops, and farm tourism	cogeneration plants, energy shields and other screens, drain water collection and/or disinfection, automation (climate computer, sower, sprinkling), installations and machines (weighing, sorting, packaging and leek-peeling machine, forcing houses, solar panels), well-illuminated and darkened greenhouses	farm sales	-
ornamental plant cultivation	new varieties and/or crops	container fields, robotisation (planting robots, potting robots, seeding robots), screens and energy shields	vending machine for, flowers, sales to individuals	-
Pig farming		group housing, pig sheds with low ammonia emmissions, manure handling and processing, climate sensors	farm butcher's	3-week system
Cattle farming				
dairy	meadow bird management, field edge environmental management and farm tourism	building (cattle sheds) and dairy installations, manure injection, working the soil without ploughing it	milk processing	-
meat		adapting cattle sheds: mixing machine for concentrated animal feed	farm butcher's, meat cutting area	-
Mixed farming				
combinations including cattle breeding	care farm	buildings (cattle sheds with low ammonia emissions, group housing, cow shed)		-
arable farming and cattle	opening up the farm to visites, production of horse milk, growing pumpkins		vending machine for milk processing with an ice-cream salon, home sales of dairy produce and vegetables	-
arable farming and pigs	sows of other breeds, free-range chickens	own mixing of fodder	purchase of a milking machine	-

sometimes being side effects of striving to cut costs, in other cases as a consequence of legislation or the need to comply with regulations. Examples of this include pig sheds with low ammonia emissions, cogeneration plants, energy shields, mechanical weed control and light, low-energy greenhouses. A cogeneration plant is a system that simultaneously generates warmth and electricity and consists of a combustion engine, a generator, heat exchangers and safety fuses and possibly a flue-gas condenser and scrubber. Energy shields limit the loss of heat to the outside (e.g. a transparent foil, translucent and/or aluminised strips). Shields or screens are also used to limit bother caused by light, serve as sun blinds, blackout screens and climate screens.

- One specific kind of product innovation – horizontal broadening – concerns the ecological dimension (meadow bird management and field edge environmental management) or has a social dimension (care farms and farms open to visitors).
- Where market innovations are concerned, various initiatives to do with vertical broadening (fruit, flower and milk vending machines, door-to-door sales and farm butchers) are linked to economic sustainability. This is the case with a number of product innovations aimed at horizontal broadening (farm tourism). Other product innovations (such as new varieties and crops) and most process innovations (automation, robotisation and buildings) boost farms' economic viability.

Why do people innovate?

A fair share of the respondents said they had received subsidies from the Flemish Agricultural Investment Fund, mainly via the Rural Development Programme for Flanders.

The most important reasons for innovating are the prospects of boosting income, improving quality, saving on costs, rationalising work or complying with legislation and rules and regulations. By the same token, legislation, the farmer's age and/or the farm's successor situation and uncertainty are the main reasons cited for not innovating.
The idea of innovating stems primarily from practical experience gained by the farmer on his own farm, followed by input from colleagues and the specialist literature and/or trade fairs. In parallel with this, practical experience gained on the farmer's own farm, colleagues' farms and the specialist literature are all cited as important to very important sources of information.
Most farmers developed their innovation by themselves. Something like 20% of the respondents said they had worked together with someone, usually suppliers. At the same time, colleagues, service providers and research establishments are relatively important.

What about innovation in policy?

The results of this study will serve the agricultural administration as the basis for its innovation policy. Innovative investments that help to boost companies' profitability are supported by the Flemish Agricultural Investment Fund, whereby policy will be geared towards the innovative value for the entire agricultural chain of production. Where innovative projects are concerned, farmers are frequently faced with rapidly changing legislation. This prevents the sector from setting out a long-term vision and creates serious legal uncertainty for farmers and their farms. In this connection it is important that corporate and policy decisions are attuned to each other, so that maximum competitiveness can be guaranteed. Innovation needs space and creativity and also requires a healthy balance between competition and cooperation. Companies have to be able to acquire the funding they need to press ahead with innovations. Setting aside reserves for innovation or including the costs of innovation in companies' bookkeeping are possible financial instruments here. Competitiveness, creativity and developing 'a sense' of innovation are key objectives when expanding training on agriculture and horticulture.

At the same time, the results will also be used to draw up a white paper on agricultural research. After all, the Flemish minister for agriculture has mandated the Platform for Agricultural Research to map out the agricultural research required up to 2020. The Platform will have to ascertain which are the main agricultural topics and sectors in Flanders and which research needs to be given priority. This endeavour is bringing together the Flemish government, universities, research establishments, technical colleges and practical centres and has been under way since the end of 2004. Closer cooperation should lead to an efficient flow of knowledge and know-how between researchers, practitioners of agriculture and the agricultural sector.

Joeri Deuninck,
Flemish government -
Division for Agricultural Policy Analysis,
Department of Agriculture and Fisheries

References

- Buurma J.S., de Buck A.J., Klein Swormink B.W. & Drost H. (2003) *Innovatieprocessen in de praktijk: grondslagen voor een eigentijds innovatiedrieluik* (Innovative Processes in Practice: Bases for a Modern Innovation Triptych). Agricultural Economics Research Institute (LEI), The Hague, the Netherlands, Report 6.03.12.
- Deuninck J., Carels K., Van Gijseghem D. & Piessens, I. (2008) *Innovatie in land- en tuinbouw in Vlaanderen: resultaten van het Landbouwmonitoringnetwerk* (LMN), (Innovation in Agriculture and Horticulture in Flanders: Results of the Agriculture Monitoring Network (LMN)), Monitoring and Study Department of the Ministry of Agriculture and Fisheries, Brussels.
- Deuninck J., Piessens I., Van Gijseghem D. & Carels K. (2007) *Innovatie in land- en tuinbouw in Vlaanderen: een verkennende nota* (Innovation in Agriculture and Horticulture in Flanders: an Exploratory Memorandum), Monitoring and Study Department of the Ministry of Agriculture and Fisheries, Brussels.
- Diederen P., van Meijl H. & Wolters A. (2000) *Eureka! Innovatieprocessen en innovatie beleid in de land- en tuinbouw* (Eureka! Innovative Processes and Innovation Policy in Agriculture and Horticulture), Agricultural Economics Research Institute (LEI), The Hague, the Netherlands, Report 1.00.04.
- OECD. (2005) *Olso Manual: Guidelines for Collecting and Interpreting Innovation Data (Third Edition)*, Organisation for Economic Cooperation and Development (OECD)

On the right-hand you can see how the plants to be cut are taken to the machine on a conveyor belt. Once cuttings have been taken they are pruned back fully. On the left-hand you can see someone checking the pruned plants and making any necessary additional cuts, if required.
The machine was developed by Willems Engineering, a manufacturer based in Laarne focusing in particular on applications in the ornamental plant cultivation sector.

Need some research done? The new research portal will show you the way!

Who is conducting research into Alzheimer's in Flanders? Who are our experts on nanotechnology? Which stem cell research projects are under way at Flemish universities?

Since the end of June 2008, answers to all of the above questions could be found on the new Flemish research portal www.researchportal.be, whose database contains a wealth of information on ongoing research projects at Flemish universities. Anyone entering a search string will see a list affording an overview of all the relevant projects, together with a brief summary of their contents and the names of the researchers involved. Users keen to find out more about a project can click on the name of the researcher or organisation to obtain the relevant contact details. If a person's name is entered into the search engine, the user will see all the projects and research groups with which the researcher is, or has been, associated.

This initiative was set up and coordinated by the EWI department. EWI provides the platform for the described application, sets common standards and makes sure that the platform is used properly when data is supplied to the portal directly by the universities. Making these data more accessible opens up a number of additional analytical possibilities for the actors involved in innovation, yields further benefits by speeding up and improving policy preparation and evaluation, and plays an important part in accelerating the innovation value chain. In this respect, the launch of this revamped portal constitutes a key contribution by Flanders to the expansion of the European knowledge economy.

Kris Maison,
Knowledge Management Division

BAN Flanders launches its own co-investment fund

At the end of 2007, BAN Flanders, the network of Flemish Business Angels[8] teamed up with Arkimedes[9], the Flemish government's risk investment vehicle, to set up the venture capital ARK-Angel Fund (AAF). The AAF – a Belgian Private Privak, limited in time and not listed on the stock exchange – will serve as the co-investment fund for the Flemish Business Angels.

The objective is to finance at least 20 innovative companies within three years. The fund is aimed at growth companies in need of between €50,000 and €700,000. The AAF is exclusively reserved for the members of BAN Flanders. Since the start, 4 shareholders have acquired stakes worth €250,000 (twice), €80,000 and €120,000 respectively.

More information?

Reginald Vossen at the ARK-Angels Fund by sending an e-mail to r.vossen@banvlaanderen.be.

8 See EWI Review (1) 2: 5 – 7.
9 See EWI Review (1) 1: 32 – 33.

Public procurement is to become more innovative

If Flanders is to maintain its competitive standing in international competition, it will have to make extra efforts to stimulate innovation. This can be achieved via the classical methods of supportive measures and subsidies, but also via the relatively new concept of 'innovative public procurement'.

Every year Belgian bodies[10] procure goods, services and work worth billions of euro. This tremendous purchasing power enables government authorities to generate tremendous impetus and encourage companies to develop innovative products, processes and services.

Conventional versus innovative

In a conventional tendering process, the government cannot simply conclude agreements with the suppliers of its choice to meet its requirements, e.g. for a new fleet of vehicles, road-building or a new website. Instead, it has to organise a certain level of competition. In this way, potential suppliers are given an opportunity to offer their products and services. The procedure between pinpointing the government's requirements and concluding an agreement with a company involves issuing and processing a call for tenders, subject to strict regulations[11]. The aim here is to ensure that the final choice of supplier is effected on the basis of objective criteria that enable all the interested parties to be judged on equal terms.

In an innovative call for tenders, the government sets out to stimulate the market by challenging the companies in question to develop solutions, services or products that don't yet exist when the call for tender is issued. The aim is to improve the quality and productivity of public service provision or unearth a solution to major socioeconomic problems to which the market does not yet have an answer or where the existing solutions fall short of requirements.

Government authorities as launching customers

Products or services that have not yet been developed are procured mainly via a so-called 'pre-commercial procurement procedure'[12], which falls outside the scope of the strict rules mentioned above. Via this procurement method, the government opts not to reserve the results of R&D work exclusively for its own use. Instead, as 'launching customer'[13] it plays an exemplary role and creates a market for the sale of certain products/services to other government institutions or companies. The keystone of this process is the interaction between the respective government authority and businesses. Already very early on it becomes clear what the government wants and where companies' technological opportunities lie.

To ascertain the effectiveness of innovative public procurement as an instrument for stimulating innovation, IWT submitted an Action Plan on Innovative Public Procurement to the Flemish government. The short-term aim is to test specific cases in relevant domains.[14] In addition, an Innovative Public Procurement Knowledge Centre is being set up to coordinate the development of innovative public procurement in Flanders. At a later stage, this centre will support local authorities when they publish notifications of assignments that will encourage companies to innovate.

10 Such as the federal government, Belgium's Communities and Regions, provinces, municipalities, public utilities, universy institutions and some legal entities.

11 See the following links to Belgian and European legislation: www.binnenland.vlaanderen.be/overheidsopdrachten/regelgeving/wetgeving.htm and www.europa.eu/scadplus/leg/nl/lvb/l22009.htm.

12 This is in contrast to the procurement of existing innovative products or services which follows the classic public procurement procedure and thus has to comply with strict rules.

13 The government serves as the 'first customer', prompting companies to invest in innovation.

14 The environment and energy; transport and mobility; healthcare; safety and security; education; construction/infrastructure; public services.

Want to know more?

If so, please contact Peter Thevissen (pt@iwt.be) or Christophe Veys (cve@iwt.be).
Institute for the Promotion of Innovation by Science and Technology in Flanders (IWT)

Towards 20-20 in 2020

The past year was a watershed in international climate and energy policy. The European Union took the lead in global efforts to combat climate change, ensure a sustainable energy supply and remould the European economy into a paragon of sustainable development in the 21st century.

In the meantime, public opinion in the Member States is also convinced that the climate problem is serious and needs to be dealt with. Europe has to adapt to a new reality that requires us to limit emissions of greenhouse gases and – in conjunction with that – develop renewable, sustainable sources of energy. In recent months a political consensus has arisen that the issue should come top of the European agenda and be assigned a central role in both the Lisbon Strategy for Jobs and Growth and in the European Union's external relations.

In the meantime it has been demonstrated that doing nothing about climate change would have very negative consequences for the world economy. According to the Stern Report[15] the costs of inaction would ultimately amount to between 5% and 20% of global GDP. On the other hand, recent rises in oil and gas prices have made it clear that the demand for energy is rising every year. Consequently, major investments in energy efficiency and the development of renewable sources of energy are not only necessary, but also economically viable.

Early in 2007 EU leaders agreed to convert the European economy even though achieving that will require tremendous political, social and economic efforts. But the European heads of government pointed out that such a change is not merely a challenge, but also a springboard to the modernisation of Europe's economy, a chance to gear it to a future in which technology and society are tailored to new requirements in an environment in which innovation creates fresh opportunities for growth and jobs.

A lever for economic growth

The European Council has set two key targets to be achieved by 2020 at the latest:
- a reduction of at least 20% in greenhouse gases (GHG) by 2020, rising to 30% if there is an international agreement committing other developed countries to "comparable emission reductions and economically more advanced developing countries to contributing adequately according to their responsibilities and respective capabilities".
- a 20% share of renewable energies in EU energy consumption by 2020.

The Council maintains that the best way of attaining these ambitious targets is for every Member State to know what is expected of them and for the targets to be made legally binding. Only then can the government fully perform its function as a lever of growth and can the private sector enjoy long-term legal certainty that will justify the investments that are necessary to make Europe a low-carbon, energy-efficient economy.

A prominent role in international negotiations

The determination exhibited by the European Council sent out an important signal to the international community. At the UN conference on climate change held in Bali in December 2007, the European Union played a key role in ensuring that a consensus was reached on the strategy that should result in a new agreement on carbon emissions being reached in Copenhagen in 2009. The EU intends to take the lead in the negotiations for an ambitious international agreement covering the period after 2012.

The package of measures that the Commission[16] proposed in January 2008[17] comprises a strategy that Europe has to draw up for converting to a low-carbon economy. The proposed measures are intended to complement each other and are designed to keep the process on track and thus help Europe achieve its ambitions in the domains of climate change, energy security and competitiveness.

Towards an integrated energy and climate policy

Over the coming months, climate change and energy policy will undoubtedly top the agenda of the European Union. The next few EU presidencies[18] will probably have to pull out all the stops to achieve the targets set in spring 2007 and attain a low-carbon, sustainable, cost-effective economy that makes a positive contribution towards the broader goals of the Lisbon Strategy for Growth and Jobs.

Finally, the Council looks set to reach agreement by the end of year on the energy and climate package that the European Commission submitted in January 2008. That would entail the adoption of the 20-20-20 measures by the end of 2009 at the latest. That way, the Member States could really take up this major challenge and call on their respective populations as well as businesses to make the necessary efforts in that direction.

Frank Vereecken,
Strategy and Co-ordination Division

15 HM Treasury, Stern Review on the Economics of Climate Change, 2006.

16 20 20 by 2020: Europe's climate change opportunity. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM(2008) 30, 23.1.2008. The information provided here largely reflects the main ideas set out in that document.

17 See elsewhere in this EWI Review: p. 37.

18 France assumed the EU presidency in the second half of 2008 and will be followed in 2009 by the Czech Republic and Sweden.

Towards a sustainable industrial policy

In October 2005 the European Commission published a Communication on strengthening EU manufacturing[19]. Against the backdrop of mounting international competition and increasing globalisation[20] it proposed adopting a more integrated approach to coordinate the relevant policy domains and initiatives better. That would help to implement the priorities of the reviewed Lisbon Strategy for Growth and Jobs[21], attracting more investment, putting knowledge and innovation at the heart of the growth process and stimulating job creation. The Commission's Action Plan for a Sustainable Industrial Policy constitutes a resolute further step down the same path.

The Commission presented its Action Plan on 16 July 2008, its aims being both to safeguard the competitiveness of European industry and to take up the respective climate- and energy-related challenges. Since sustainable production can only really have an impact if consumption is sustainable as well, the Commission decided to lump the Action Plan on Sustainable Industrial Policy together with the Action Plan on Sustainable Production and Consumption[22]. That, too, is an integrated approach!

Action Plan resting on three pillars

Where the development of policy is concerned, the main focus will be on products' consumption of energy and raw materials. At the same time, the necessary degree of attention will be paid to opportunities for scaling back the use of hazardous or scarce materials.

The Action Plan rests on three pillars: more sustainable products via a dynamic product policy, more flexible production through an adapted industrial policy and complementary initiatives taken at global level.

Dynamic product policy

Product policy constitutes the core of the Action Plan and will supposedly lead to more energy- and environmentally friendly products, services and technologies. The European laws governing this product policy already exist. They merely need to be coordinated more effectively and shored up, where necessary.

All this should lead to a framework comprising:

- Mandatory minimum standards

  The mandatory minimum standards will be drawn up as part of the Eco-Design Directive which sets environmental standards, albeit only for products that consume energy; the scope of its application should be extended to so-called energy-related products, which do not themselves consume energy, but do influence energy consumption (e.g. windows, shower heads, cranes, etc.)[23]. Since a 'framework directive' is involved, specific implementing measures are being developed for various product groups. These will take account of sales figures, environmental impact and the leeway for improving environmental services. In addition to mandatory minimum standards, the implementing measures will also set voluntary standards for environmental performance, which will serve as input for the European Ecolabel scheme. It will be a 'dynamic' product policy, with the Commission reviewing the respective standards, updating the applicable conditions regularly or whenever sudden changes justify so doing.

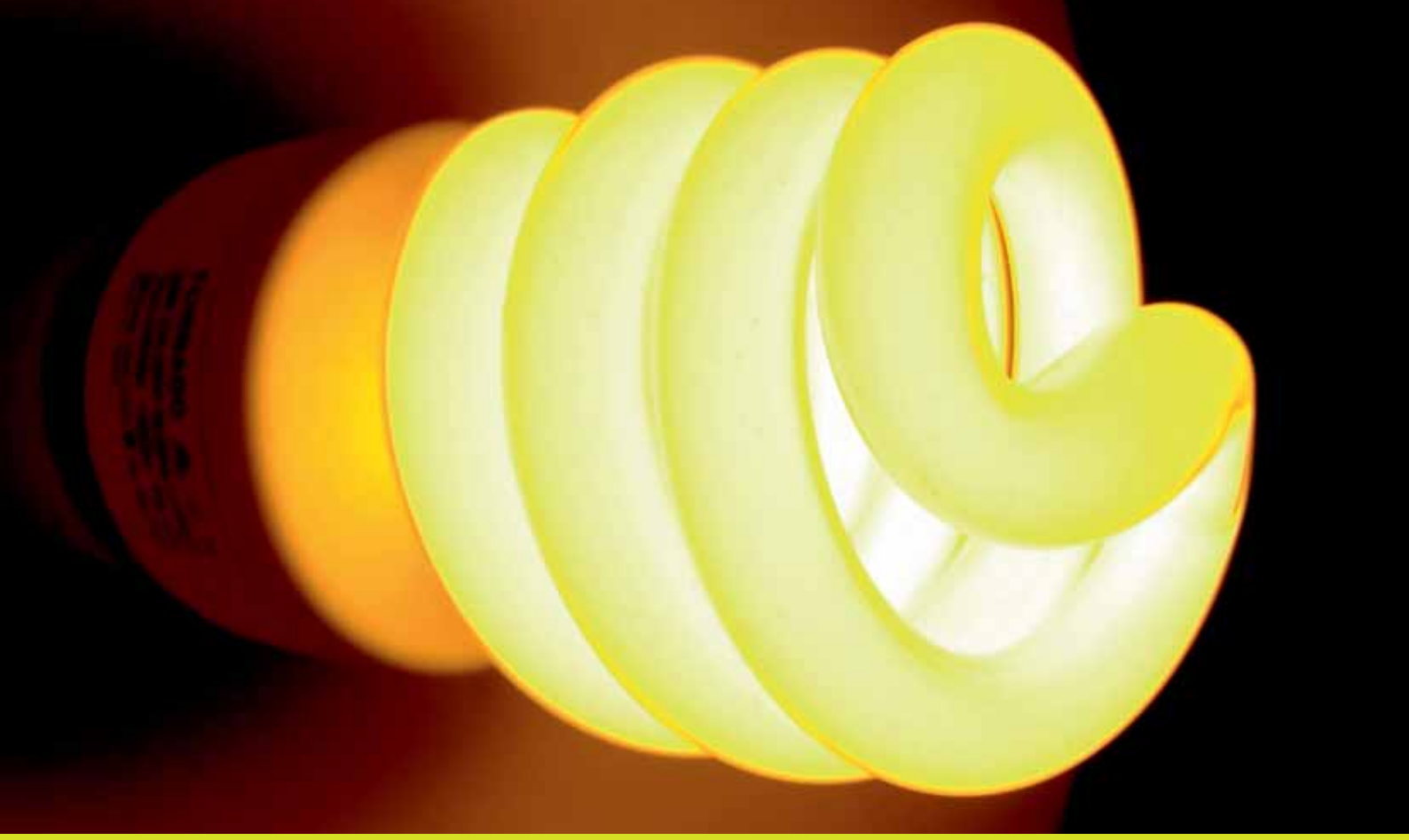
- A more sophisticated Ecolabel scheme

  This will be based on the directive on labelling energy consumption and the Ecolabel regulation. The classification of products will not necessarily entail an obligation to physically apply a label to them. After all, the results could also serve to determine which products are eligible for public procurement or for fiscal and financial stimuli autonomously enacted by the Member States. Naturally, the Ecolabel will be closely associated with the application of the rules governing eco-design and energy labelling.

- Supporting measures in the form of fiscal incentives and public procurement based on benchmarks

  Today, various Member States already have minimum standards that products have to meet to benefit from certain financial incentives or come into the reckoning for public procurement. Examples include the financial subsidies and tax breaks available in Flanders for energy-saving investments, e.g., installing a geothermic heat pump, insulating a roof or fitting double glazing. However, the criteria may differ substantially from one country to another, which could lead to the European Single Market for public procurement remaining fragmented. For this reason, the Commission proposes linking environmental performance standards to the categories set out in the Eco-Design Directive and the directive on energy labelling as single points of reference. This will result in an integrated policy: the mandatory minimum standards will determine whether or not a product may be sold, and the voluntary standards will determine whether or not products are eligible for fiscal incentives or public procurement.

Furthermore, the Commission will be developing additional initiatives with respect to greening public procurement, possibly by setting targets based on the performances of the best Member States and on model specifications for tenders that are in line with the rules governing the internal market. These will be voluntary measures. In view of the positive influence that greening public procurement can have on the capacity for innovation by the economy, national, regional and local governments clearly have an interest in taking it on board.



Adapting industrial policy

To safeguard the competitiveness of European industry, lend maximum support to the development and commercialisation of eco-industries and promote eco-innovation as widely as possible, industrial policy will also be closely examined.

In practice, among other things the Commission is thinking of revising the Community eco-management and audit scheme (EMAS)[24]; a system for monitoring the environmental performance of new green technologies; an adapted industrial policy for the respective eco-industries; and offering additional support to SMEs for improving their environmental performance. In fact, the Commission has already started doing this, having devised a programme designed to help small and medium-sized enterprises comply with environmental legislation.[25]

Initiatives on the world stage

Finally, the Commission will make sure that investments by industry in this domain are economically viable and that they can benefit from so-called 'first mover advantages'. To complement a worldwide follow-up agreement on the Kyoto Protocol, it will encourage the conclusion of worldwide sectoral agreements between the industrial parties responsible in both industrialised and developing countries. Moreover, the Commission will encourage and stimulate the worldwide adoption of European norms and standards.

Quite right!

The Commission views eco-business as an important area in which to preserve the competitiveness and ultimately the prosperity of the EU Member States. In this connection, its priority lies in measures that will lead to savings or greater efficiency in the consumption of energy and natural resources.

It does not seem a very likely scenario that producers will not make use of a label that underscores their energy efficiency if the label in question is used throughout the internal market. After all, they will be able to persuade consumers to buy a more expensive product if it delivers subsequent savings. Take for example household appliances to which the Eco-Design Directive already applies. Consumers are willing to pay more for appliances with an A++ rating because they know that their energy bill will be lower as a result. Precisely the same applies to companies: if they can turn out their products using less energy or consuming fewer raw materials, this will not just mean savings on their final balance sheet: anyone producing more cheaply will also bolster their competitive position in the marketplace.

The growth potential of eco-business and the leading position currently occupied by European companies in this sector merely strengthen the Commission's belief that it is quite right to play the green economy card.

Karel Boutens,
Entreprise and Innovation Division

19 COM(2005) 474.

20 See EWI Review (1) 3: 10 – 12.

21 The Lisbon Strategy is the EU's socioeconomic strategy. At the EU Summit held in Lisbon in 2000, the heads of state and government decided "to make Europe the most competitive knowledge-based economy in the world by 2010, capable of sustainable growth with more and better jobs". Subsequent meetings of the European Council set systematic, specifi objectives to be attained in various policy domains (e.g. a level of employment of 70%, 3% investment in R&D raised to 3% of GDP [See EWI Review (1) 1: 14 – 17 and EWI Review (1) 2: 32 – 37] etc.). In 2005, that strategy was reviewed. With the exception of the objectives cited above regarding the level of employment and investment in R&D, an end was put to the profusion of quantitative objectives. The strategy was focused on growth and employment and those Member States were called upon to draw up three-year National Reform Programmes based on so-called 'Integrated Guidelines' laid down by the Council at the Commission's suggestion. Ever since, the Member States have had to submit annual reports on the implementation of their National Reform Programmes. For more information, see: http://ec.europa.eu/growthandjobs.

22 See http://ec.europa.eu/enterprise/environment/sip_en.htm.

23 The Directive does not apply to transport products since these are covered by specific rules aimed at minimizing their environmental impact.

24 EMAS is a voluntary instrument offering recognition to organisations that continually improve their environmental performance. Organisations that sign up to the scheme apply an environmental management system and report back regularly on their ecological performance by publishing an independently verified environmental declaration. In return, they are allowed to use the EMAS logo. In Belgium, most of the organisations involved are in the Walloon Region. Eaxamples of companies based in Flanders include Volvo (Ghent), Honda (Aalst), Electrabel (Doel), VLAR (Willebroek), Lannoo (Tielt) and Aswebo (Bruges). For further information, visit http://ec.europa.eu/environment/emas/.

25 COM(2007)379.

Sustainable development: changes and challenges for businesses and government authorities

Which monumental changes have taken place over the last 30 years? Sustainable development made the breakthrough from being a political issue dealt with by the United Nations to a current issue at Community level. Meanwhile, the economy has evolved from being international to truly global[26]. Modern communication and technology have accelerated these developments. A critical attitude has arisen on the one hand from backpedalling national governments, and on the other because of international regulations that fall short of what is required, international executives with too little decision-making power and the marked individualisation of values in the West.

We have witnessed the birth of corporate social responsibility (CSR): the voluntary framework based on companies' adoption of a responsible attitude vis-à-vis society. This article takes up the current trends in CSR and maps out the challenges faced by businesses and government authorities alike. It also elucidates Flemish CSR policy.
Awareness of CSR is very widespread. Today we have a different way of looking at how companies take their responsibility and create added value. But despite the mounting importance and growing number of initiatives, CSR is still far from being 'common practice', even though we can distinguish some clear trends.

Companies are taking responsibility by making fresh commitments to act more transparently, harmonise their efforts more, cooperate with several stakeholders, adopt a broader outlook (namely the chain), and make better use of knowledge development.

From these trends it immediately becomes apparent where the future challenges will lie.

1. Fresh commitments
There is a trend towards making voluntary commitments to CSR by implementing various kinds of codes of conduct. Companies team up with other stakeholders to make pledges that imply delivery on and compliance with such promises. One example concerns the worldwide agreements reached between social partners, like the one recently concluded by Umicore. That agreement guarantees freedom of association in all establishments worldwide, the prohibition of forced labour or child labour and a ban on discrimination when hiring new recruits. These are basic conventions of the International Labour Organisation (ILO). Codes of conduct, which form one type of such pledge, have also evolved. Originally they were designed more to prevent 'bad' behaviour, but now the focus is shifting

towards actively promoting 'good' conduct. And research shows that this is also more effective.

2. More transparency
Social actors maintain that companies should show what they are really doing with respect to CSR, i.e. that they should 'walk the talk'. External observers are calling for greater transparency from companies. The question of how to communicate this is becoming a central issue, the answer being sustainability reporting. Another recent development is that other organisations, too, such as government authorities and NGOs, are busy with CSR and sustainability reporting. For instance, a working group on this subject was started up in the Kauri network[27]. In this connection, GRI[28] as an international guideline is on the ascendancy both as regards companies and other organisations. The government also views it increasingly as a lever for CSR. For example, the CSR resolution by the European Parliament (13 March 2007) for the amendment of the Fourth Company Law Directive[29] to have social and environmental reporting included in today's financial reporting.

3. Striving for harmonisation
There is a growing number of labels that lay claim to cover various aspects of sustainability: fair trade, labels for supporting local communities, ecolabels, labels associated with the environment and social criteria, like the Rainforest Alliance[30], and so on. This is not making life any easier for either entrepreneurs or consumers. In addition, the cutting back of initiatives is preventing their application on the necessary scale, so CSR is not being commonly practised. There is also a call for more standardisation and harmonisation. Leading labelling organisations are currently working together in platforms like International Social and Environmental Accountability Labelling (ISEAL)[31] and ISO 26000 (sustainability standard) to achieve greater clarity via shared basic standards. Governments can also play a role here by preventing any further scaling back of initiatives and joining up better with the respective international guidelines and standards.

4. Several stakeholders are working together
There are more and more initiatives concerning cooperation between companies or entire sectors of industry with NGOs or other actors. For instance, there are sectoral initiatives in the textile and sports articles industries[32], in the forestry and timber sectors, in fisheries, banking[33] and so forth. These forms of cooperation can lead to codes of good practice that may even be important to high-street florists (e.g. The 'happy flowers' action[34]). Belgian companies are also involved in this. Unilever, Delhaize and Quick have only MSC[35]-labelled fish in their fish fingers, fish burgers and prepared deep-frozen products. In Belgium, more than 25 companies have already signed up to the use of FSC[36] products, including. Brico, Dreamland, Gamma and Hubo.

5. From company-oriented thinking to chain-oriented thinking
Often, the boundaries of an individual company are exceeded and a company's outlook becomes a chain-oriented vision. But what does the CSR approach mean to our suppliers, and their clients? These questions show that many decisions still somewhat gloss over the potential for integrating environmental and social considerations in company management, e.g. in procurement.
People's outlook is shifting the confines of the company to a chain-oriented approach. This represents a change from end-of-pipe thinking to consideration of the entire respective life cycle, with a company's activities steadily being viewed as part of a larger chain of production. This change was partly prompted by a growing understanding of how human activities are interlinked and the complex impact this has on the ecosystem, biodiversity, climate change and social conditions. Companies are also placing greater emphasis on working together with other actors in their respective chain, as well as becoming more outwardly oriented and entering into dialogue with more stakeholders than just customers.

6. The need for knowledge development
Knowledge is occupying an ever more important place in our society. More and more companies are looking for links between economic and social benefits. A number of initiatives are springing up, like the CSR Flanders Digital Knowledge Centre[37], networks teaching CSR, and networks such as Business & Society Belgium[38] (CSR corporate network) and also Kauri. 2002 saw the establishment of the European Academy of Business and Society (EABIS[39]), an alliance of business schools, universities, corporate organisations and businesses that aims to make CSR the focus of management theory and practice. In Flanders as well, university associations are striving to integrate CSR in curricula and corporate management.

From a culture of possession to a culture of consumption

These trends show how the needs for a sustainable society and a sustainable economy are being fulfilled in practice. At the same time, a shift is under way from linear recovery – where economic thinking predominates and the ecological and social consequences are only dealt with later on – to the simultaneous integration, bolstering and expansion of the 3 Ps (people, the planet and profit)[40], i.e. to thinking in terms of cycles: the so-called 'closed loop'.

One element of this is that a product is made in such a way that it can be reused and does not cause any (non-decomposable or non-biodegradable) waste, this being the cradle-to-cradle principle. This is opening up new vistas for corporate social responsibility, namely product liability. Products do not 'disappear' from view as soon as they are delivered to consumers, but instead are considered to return to the chain of production.

This is also changing things on the demand side. The concept of consuming – as we currently understand it: buying, becoming an owner and then 'throwing away' a product – is shifting. Society is moving away from a culture of possession to a culture of consumption. In terms of the cyclical processes involved, this means that the hiring or use of products for a limited time will gain in popularity, e.g. car parts or the leasing of consumer articles like furniture, floor coverings in buildings and so on. When this happens, companies stop selling products and start supplying a 'full service'.

Not only is innovation speeding up, but its types and aims are also changing. No longer are we faced with competition between similar products in the same markets. The name of the game is creation; the development of new concepts, services and systems; product efficiency and also the efficient use of resources. As a result, more and more work will be done on an inter- or multidisciplinary basis. Fresh insights and even new disciplines and areas of knowledge will take shape.

These developments may speed up very considerably within the next few years, spurred on partly by urgent needs such as those imposed by climate change, but also as a result of the emergence of new technology, knowledge and communication. When that happens, a sustainable economy will entail both sustainable production and consumption and also an integrated product policy, with innovation playing a key role.

Obstacles to greater CSR

CSR as a concept has been explored and accepted by the respective social actors, but is not yet fully established. As mainstream organisations, employers' and sectoral organisations are the perfect channel of distribution for taking CSR to companies. Their agendas are definitely paying greater attention to CSR. Nonetheless, there remains extensive potential for doing more. This can be explained by the fact that umbrella organisations usually lean towards a 'common denominator approach' that tends to clash with practising proactive CSR.

One way of putting it is that society has a new vision about how companies operate. The question is whether companies themselves share that vision. Alongside the platforms and projects by proactive companies and employers, up to now it has mainly been the government that has taken the initiative in a bid to set up channels for learning and the exchange of knowledge. At the same time, there is a broadening process going on, from CSR to other forms of organisation, with NGOs and other social players becoming more active. Indeed, some people maintain that these players are on the way to taking over the CSR agenda from companies.

There is a tendency to evaluate the existing regulations – whether applying under corporate law or commercial law – on the basis of their stimulating or off-putting CSR content. Within the framework of the respective regulations, there is a desire to stimulate and reward socially responsible behaviour and or remove any obstacles that unintentionally block CSR. So the government can positively support and foster CSR behaviour.

CSR also requires regional governments to coordinate their policy with a view to ensuring the sufficient harmonisation of the various initiatives taken, thereby creating a *level playing field*[41]. Where some channels are concerned, regional and national governments are participating more effectively in the international development of standards and norms and supporting their application at local level. This is not a constraint, but much rather a 'framing' of the space within which government authorities can conduct a meaningful CSR policy entirely in keeping with the concept 'think globally, act locally'.

Engine for renewed economic growth

In recent years, CSR has increasingly become a part of the social fabric, so there is now no going back. It is accepted as a concept but is still evolving, and some clear trends can be distinguished that are important both to companies and society as a whole.

What seems to be going on? Organisations with an integrated CSR process, are introducing important mechanisms for innovation. They are not merely looking at the short term, but also considering the longer term, keeping in touch with stakeholders who have other visions about how the products, services and organisations of the future ought to look. They are introducing new technologies more quickly, and the fruits these technologies yield are also being plucked faster. Organisations are quicker to react to consequences that will not gain any acceptance in society. They are looking more closely at social developments and the way in which they themselves fit in with them. In this way, CSR is becoming a strategic process of innovation that strengthens organisations' bonds with society. More CSR leads to more innovation and becomes the engine driving renewed economic growth as the 'sustainable economy' becomes a fact.

Dirk Le Roy,
Sustenuto

Meanwhile in Flanders

The Flemish government is convinced, where organisations are concerned, that CSR constitutes the right framework for facing up to present and future challenges. Consequently, CSR is given pride of place in Flanders in Action[42] and the Flemish Strategy on Sustainable Development. The minister responsible for the social economy says that CSR is the joint responsibility of businesses, the government and the education system. In recent years, numerous management models, instruments and technologies have been developed based on these three pillars.

All this knowledge and information has been gathered at the Digital Knowledge Centre CSR Flanders, which serves a starting point and crossroads for all interested parties seeking information on CSR or wishing to accumulate and share know-how. The main target group is Flemish business. There, both SMEs and larger organisations find a clear conceptual framework, relevant publications and links on over 20 topics. However, other actors (in education, at government level, NGOs, the general public, etc.) can obtain and offer relevant information via the knowledge centre as well.

Taking action!

The next step will entail taking CSR to the level of action. To that end, recently - together with the Flemish ESF-Agency – a call for tenders was issued with a view to ushering in CSR in SMEs. Six promoters (De Punt, the Economic Council of East Flanders (EROV), the West Flanders Development Agency (POM West Flanders), Randstad Belgium, UNIZO, East Flanders Chamber of Commerce) are raising awareness among SMEs about CSR and urging them to embrace it or anchor it more deeply in the way they run their business. The promoter conducts a free CSR scan in any interested companies and then draws up a CSR action file together with the SME in question. SMEs can obtain subsidies of 50% for any action files they implement, up to a maximum of €7,500 per action. Actions can start immediately and run up to 31 December 2009 at the latest.

For more information on CSR, Flemish policy and the action concerning SMEs, see **www.mvovlaanderen.be** (in Dutch) or send an email to **mvo@vlaanderen.be**.

Els De Leeuw en Koen Vanbrabant,
Department of Work and Social Economy

26 See EWI Review 1 (2): 10 – 12.

27 Kauri is a Belgian multi-actor network and knowledge centre that brings companies and NGOs together to discuss global sustainability issues and practices. See www.kauri.be.

28 The Global Reporting Initiative (GRI) is an international organisation that issues guidelines for sustainability reporting. In a sustainability report an organisation publishes details of its economic, environmental and social performance. GRI's mission is to make sustainability reporting by all organisations as routine and comparable as financial reporting, irrespective of the scope, sector or location involved. See www.globalreporting.org.

29 Fourth Council Directive 78/660/EEC of 25 July 1978 stipulating the contents of companies' annual accounts.

30 http://www.voedingscentrum.nl/EtenEnHerkomst/Herkomstkeurmerken/Rainforest+alliance.htm.

31 www.isealalliance.org.

32 www.bsci-eu.org.

33 www.equator-principles.org.

34 www.blijebloemen.be.

35 The Marine Stewardship Council (MSC) is an independent non-profit organisation promoting responsible fishing practices – see www.msc.org.

36 The Forest Stewardship Council is is an independent non-profit organisation promoting responsible forest management – see http://www.whyfsc.com/nl/.

37 www.mvovlaanderen.be.

38 www.businessandsociety.be.

39 www.eabis.org.

40 CSR is all about simultaneously integrating the 3 Ps (people, the planet and profit) into corporate management.

41 A climate where all parties can confer on an equal footing.

42 On 11 July 2006 the Flemish government rolled out the socio-economic plan *Vlaanderen in Actie* (Flanders in Action). The aim is to ensure that Flanders becomes one of Europe's elite regions in terms of sustainability by 2020. The plan in question is based on projects designed to rise to challenges in four main areas: talent, logistics and mobility, creativity and innovation, and internationalisation. A large number of projects has already been realised or is currently under way – see http://www.vlaandereninactie.be/nlapps/docs/default.asp?fid=88.

CSR is not the only strategy being deployed by the Flemish government to bring about sustainable development. Other policy domains are also taking up this topic and paying it close attention. A future edition of EWI Review will contain a contribution on Flemish climate policy by the Department of Environment, Nature and Energy.

Low-energy heating

As energy prices rise, it is becoming increasingly important to save energy worldwide. Accordingly, there is also mounting interest in energy-saving technology in heating and cooling systems. Jaga – a leading manufacturer of radiators – intends to play an exemplary role in this connection.

Thus, the development of environmentally responsible heating systems has become a top priority in the company's activities. Jaga[43] is continually striving to develop radiators that achieve top marks in a life-cycle analysis (LCA). Ultimately, the company hopes to produce a radiator with a 'cradle-to-cradle'[44] certificate.

An LCA calculated by Jaga, in cooperation with Flemish Institute for Technological Research (VITO)[45], showed that more than 99% of the damage to the environment caused by a radiator during its life cycle is caused by end users' energy consumption. It was that study which inspired Jaga to focus on energy-saving systems.

Slave and master system

After 40 years of product development, Jaga has introduced onto the market a sophisticated heat exchanger named Low H_2O, which forms the core of its Low H_2O radiator. The low mass and low water content of the heat exchanger (see Figure 1) means that although the radiator stores very little energy, it transmits a great deal of energy from the heated water to the immediate surroundings. What is more, the Low H_2O radiator can respond extremely rapidly to changes in the heat required without wasting energy on heating up its own mass. As a result, it reaches room temperature faster than any other heating system. Moreover, rooms surrounded by lots of glass and exposed to lots of sunshine will not overheat because the Low H_2O radiator does not give off any heat when the room thermostat switches it off. By contrast, high-mass systems continue to give off heat even when it is not required. The heat exchanger is not only fast and light, but also perfectly capable of using very low water temperatures to radiate heat.

Figure 1: The modern heat exchanger from the Low H_2O radiator

Figure 2: A Low H_2O radiator with DBE

Another recent development that can be added to that of the heat exchanger is the celebrated Dynamic Boost Effect (DBE). The DBE unit comprises a set of fans which, if need be, can accelerate the air speed over the heat exchanger. The DBE multiplies the heat exchanger's capacity by dynamically boosting its static convection[46]. As a result, end users can opt for a much smaller radiator while attaining the same peak capacity. The DBE microprocessor that controls the fans' number of revs also measures the water temperature in the heat exchanger and the room temperature. As a result, the DBE system can only work when the external control system, like the room thermostat, sends warm water to the heat exchanger. Furthermore, the number of revs of the DBE fans is always geared to the required heat and decreases as soon as a comfortable room temperature has been reached, whereupon the DBE unit cuts out completely, leaving the radiator to give off heat via static convection only. This makes the DBE unit an intelligent, autonomous system. Like a slave it follows its master, the room thermostat or adjustable thermostat on the radiator, and makes sure that the radiator's capacity remains optimal at all times. Toing and froing[47] by the room thermostat is prevented by the radiator never delivering a high capacity once the set comfort temperature has been attained.

As a result, Low H_2O appliances (see Figure 2) are invariably better for fulfilling Jaga's mission of producing radiators that save energy and no energy is wasted on internal storage or overheating the room. Consequently, even in an optimally insulated house, lowering the room temperature by just 2°C at night (or during the day when nobody is home) can result in a saving of more than 15% of energy costs.

The modern form of the heat exchanger and DBE system mean that the Low H_2O

radiator can work with water temperatures lower than 30°C, without requiring another high-mass heating system. This leaves the user free to opt for an environmentally responsible source of energy like a condensing boiler, heat pump or solar boiler.

Energy studies

Over the years, Jaga has worked together with various universities to develop its heat exchanger. At the same time, numerous studies and tests carried out by Jaga's laboratories and independent bodies highlight the energy-saving effect of its Low H2O systems.

- An experiment conducted in two identical houses by the Building Research Establishment[48] (BRE) in Great Britain shows that a typical British family can save between 5% and 15% of its fuel/heating costs by using Jaga systems. The saving compared with slow radiators will depend on the climate situation and is greater in spring and autumn when the demand for heating fluctuates more.
- An experiment carried out by Eindhoven University of Technology (TUE) and commissioned by the Dutch Agency for Energy and the Environment (NOVEM) shows that Jaga Low H2O systems (even unaccompanied by a DBE system) can work with a water temperature lower than 30°C and thus also with a low-energy heating device. NOVEM published that report in TVVL[49] in October 2003, putting paid to rumours that modern convection systems are still incapable of working with a low water temperature.
- Tests conducted in the 'Jaga Experience Lab' show how DBE systems save energy. A number of foreign scientists have come to Jaga's laboratories to corroborate their theories. The corresponding analyses and lab tests demonstrate that a small Low H2O-system can perfectly complement underfloor heating by using heating water from the same circuit to enable heating to be controlled and temperatures to be lowered at night.

Some of these reports can be consulted on the website:
http://www.heating-studies.org

Towards cradle-to-cradle

Meanwhile, Jaga is pressing ahead with its ecological developments. Its Development Department is certainly not standing still. Shortly it will be marketing a radiator designed in line with the 'cradle-to-cradle' philosophy, every component of which can be recycled or is biodegradable. Moreover, future DBE systems will not just generate heat, but also be capable of cooling. This will make it possible, using a simple radiator and a heat pump, to put the heat taken from the soil in the winter back in the summer. Watch this space!

Mark Ruison,
Jaga

About Jaga

Since the early 1960s Jaga has astounded heating specialists by developing concepts and products that are totally new both in technical and aesthetic terms. As a result, today the company is active in five domains:

- Energy-Savers > Low H2O radiators, the focus being on saving energy and sustainability
- Eye-Catchers > Designer radiators in which workmanship and artistic design play an important role
- Top Performers > Radiators that work both statically and dynamically and not only generate heat, but also cool and ventilate
- Experience > A group responsible for drawing attention to the Jaga brand, ranging from attending trade fairs to events to the Jaga Experience Lab
- Uchronia > A platform for open innovation[50].

Jaga has 650 employees, who between them generate a turnover of €80 million. The company is active throughout Europe, with branches in Belgium, France, the Czech Republic, the Netherlands, the UK and Germany. Jaga also exports in quantity to other markets, including Australia, China, Japan and Canada.

43 http://www.jaga.be/Default.aspx.

44 See p. 18.

45 See p. 23.

46 Heated air is lighter than hot air and rises, resulting in natural circulation of air through the heat exchanger and an exchange of heat between the heat exchanger and the ambient air.

47 This means the heating device frequently switching on and off, which prompts a lower yield and causes more wear and tear of the heating device. For instance, this state of affairs arises when temperature measurement by the room thermostat is slower than the heating and cooling of the room itself, e.g. using fast, non-modulating heating appliances.

48 The comparable Belgian body is the Belgian Building Research Institute (CSTC/WTCB).

49 A monthly publication produced by the Dutch Society for Building Services.

50 See pp. 46 and 48.

The Flemish Institute for Technological Research (VITO)

Technology with ecological and economic benefits

Flanders' ambition is to rank among the leaders in the European knowledge economy by continuing to build on and utilise its existing knowledge potential. Four actors besides Flemish universities and technical colleges loom large in the innovation landscape: our strategic research centres Interuniversity Micro Electronics Centre (IMEC[51]), which focuses on nanoelectronics , the Flanders Interuniversity Institute for Biotechnology (VIB), the Flemish Institute for Technical Research (VITO), working on energy, materials and the environment, and the Interdisciplinary Institute for Broadband Technology (IBBT). The department of Economy, Science and Innovation of the Flemish government is responsible for monitoring these strategic research centres.

Today we find ourselves faced with melting ice-caps, freak weather, migrations by exotic species to new habitats and many other environmental and energy-related problems. The joint response to these pressing problems is 'sustainable development'. In this domain Flanders has a major asset: the Flemish Institute for Technical Research (VITO).

VITO in a nutshell

VITO has its roots in the Belgian Nuclear Research Centre (CEN/SCK), which was set up in Mol in 1951. The Centre had specialist know-how and equipment, which prompted the decision in the 1970s to conduct not only nuclear research, but also research into the environment, energy applications and materials. CEN/SCK was split up in 1991, following the reform of the Belgian state. Under the agreed allocation of responsibilities[52], nuclear activities remained in federal hands, while the other activities were handed over to the Flemish Region. These activities were accommodated at a brand new research centre, VITO, which would subsequently focus on research into the environment, energy, natural resources and materials.

As a research organisation, VITO was assigned to stimulate the development of technological solutions for sustainable development and strengthen the economic and social fabric in these domains. The environment and health are fundamentally interlinked, since the quality of the environment is a key factor for determining health and well-being. Consequently, the area where the environment and health overlap is a priority area of knowledge for VITO.
In addition to research, VITO is also charged with executing reference tasks, a service that the research establishment provides for the Flemish government. These tasks consist primarily of testing the quality of environmental and energy-related measurements and analyses that need to be conducted according to environmental regulations. In this respect, VITO differs from the other strategic research centres.

Since its inauguration in 1991, VITO has grown into a research centre with more than 500 staff. In 2008, the centre had a budget of €80 million, €44 million of which it generated itself. At European level, too, VITO ranks among the top 10 in its research domains.

Key research domains

There are many facets of sustainability, so the range of research carried out by VITO is also very extensive, including both energy technology (renewable energy, biofuels, smart grids), environmental and process technology (reuse of waste water), research into sustainable materials and chemistry, environmental measurements (water and air quality), environmental toxicology and earth observation as integrated environmental studies.

- **Energy technology**
  Energy efficiency is an essential prerequisite for bringing rising energy consumption to a halt, combating climate change and diminishing our dependency on imported fossil fuels. It speaks volumes that in 2007 the European Commission presented an action plan designed to cut energy consumption by 20% by 2020[53]. In that framework, VITO is contributing to the work being done on the new Ecodesign Directive[54] for end products that consume energy, such as lighting (which accounts for 20% of electricity consumption), fridges, TV sets, and so on. The ambitious targets set out in the European Climate Plan are prompting industry, too, to take resolute measures. Against that backdrop, VITO recently demonstrated that exploiting residual warmth is a promising approach for the chemical sector in the port area[55], among others. The strategic research being conducted here is focusing on so-called 'smart grids' featuring intelligent integrated energy storage, among other things, including a hybrid drive and autonomous, intelligent network switching and connections and also intelligent buildings.

- **Materials technology**
  VITO's Materials Centre focuses on encouraging and implementing sustainable use and on processing and re-using natural resources and materials. In so doing it takes account of the full life cycle of materials. VITO has gained a reputation, among other things, for expertise in ceramic materials and powder metallurgy. Ceramic materials boast unique properties, including a high melting point and extreme hardness. Often they constitute the only possible solution in applications such as cutting tools, electrical resistance, filters, and so on. Medical and chemical companies, the automotive industry and water purification plants all make use of porous structures based on powder technology. However, a less well-known fact is that VITO has the largest and most advanced laser centre in the Benelux countries. Light amplification by the stimulated emission of radiation is nothing more than an intense, directed monochrome light, in precisely one colour. Laser technology is increasingly finding its way into modern production processes, including for cutting and welding metals, joining plastics and treating metal surfaces. Compared with other processing methods, laser technology has the advantages of being contactless and environmentally friendly, as well as being fast, fully automated and enabling a high degree of precision, at the same time while consuming a minimum amount of materials and energy.

- **Sustainable processing industry**
  In the 'sustainable processing industry' domain, VITO develops new industrial technologies for (waste) water purification and the decontamination of polluted soil and sludge, and industrial product- and process-related innovations. VITO is also actively involved in the development of membrane processes and supercritical liquid reactors. For example, together with Agfa-Gevaert, VITO developed an electrolysis membrane (Zirfon®Perl membranes) for the large-scale production of hydrogen. For years now, hydrogen has been earmarked as a potential energy carrier and energy storage medium. So this new development brings the long-awaited 'hydrogen economy' one step closer.

- **Environmental analysis and technology**
  In the 'environmental analysis and technology' domain, VITO focuses on measuring and analysing pollution, whereby the emphasis is not on conducting routine measurements, but on developing specialised analytical and measurement methods, such as dioxin measurements in flue gas and the environment; sampling and analysing the atmosphere in workplaces; conducting aerosol studies (on particles in the air), carrying out odour studies and so on. VITO is Flanders' reference laboratory for environmental analysis.

- **Personal exposure**
  Under the heading 'personal exposure', VITO examines the risks posed to humans by chemical products and pollution (toxicology) and to plants and animals (eco-toxicology). The studies conducted in this domain are based on the latest molecular and technological developments, including in-vitro technology. They also incorporate standard tests that are carried out under strict quality conditions (good laboratory practices or GLPs). For instance, for years now VITO has applied itself to the development of methods that offer an alternative to animal experiments for testing allergens in cosmetic products or in connection with toxicological research carried out on new products. Toxicity tests set out to ascertain at which concentration a chemical substance proves fatal to an organism. Alternative methods need to be found to replace these kinds of experiments involving animals. Via CARDAM, the Centre for Advanced Research & Development on Alternative Methods, VITO makes such know-how available to industry and the public sector.
  Another representative project involves research into the physical activity and health risks of cycling under different circumstances. This research is designed to map out

the risks and benefits of a modal shift from the use of cars to bicycles and is intended to provide insights into the positive effects of cycling on individuals' health (such as a lower probability of heart and vascular diseases, diabetes, better fitness) and the risks run (traffic accidents and exposure to vehicles' exhaust fumes).

- **Earth observation**
  Climate change can be measured in various ways by weather stations. The catch is that such weather stations are unevenly divided over our planet's surface. Satellites or aircraft can be used to obtain a full picture. As a result, satellites are absolutely indispensable for climate research. Since the launch of the SPOT 4 satellite (vegetation) in 1998, VITO has managed to become the European leader in processing earth observation images. VITO is researching new methods for improving images provided by satellites or aircraft and making better use of them. Over the last few years, the main emphasis has been on a shared, open infrastructure for processing observation images, with all the functions that are needed to gain a clearer view of environmental processes such as vegetation and crop monitoring. At the same time, VITO is also involved in the development of state-of-the-art high-resolution sensors for earth observation, which are being developed for the European Space Agency (ESA). The finishing touches are currently being put to a new Airborne Prism Experiment spectrometer, dubbed APEX for short. Researchers can use the APEX spectrometer to map vegetation with extreme precision, ascertain the danger of avalanches and make accurate crop predictions. The maiden flight of the APEX sensor is scheduled for 2008.

A research partner for companies and government authorities

Nowadays more and more companies are using innovative technologies to improve their production processes and cut their costs. Manufacturing products more efficiently to do sustainable, successful business is a prime concern of any company. After all, new technologies can help to create added value. As a research partner, VITO provides the technical expertise and high-quality testing facilities that can help companies develop and implement such new technologies. Alongside its mission of becoming an international centre renowned for its expertise, VITO wants to become more active in Flanders. To this end, in addition its headquarters in Mol and an office in Berchem, it has also expanded its geographical reach by opening a representation in West Flanders, with a view to bringing it closer to its customers.

VITO's PROmotion and DEMonstration Centre for Environmental and Energy-Friendly Technology (PRODEM) is an example of how VITO helps companies to select viable sustainable technology. PRODEM's mission is to bring home to SMEs the advantages of new environmental and energy-friendly technologies. Based on feasibility studies, laboratory programmes, research on the pilot level or tests conducted in the respective company, PRODEM seeks the most suitable solution for a specific situation. PRODEM has already helped over 300 SMEs to optimise their processes and installations (water purification, air conditioning, waste processing, manure processing, etc.), validate the potential of innovative technologies and develop new environmental and energy technologies.

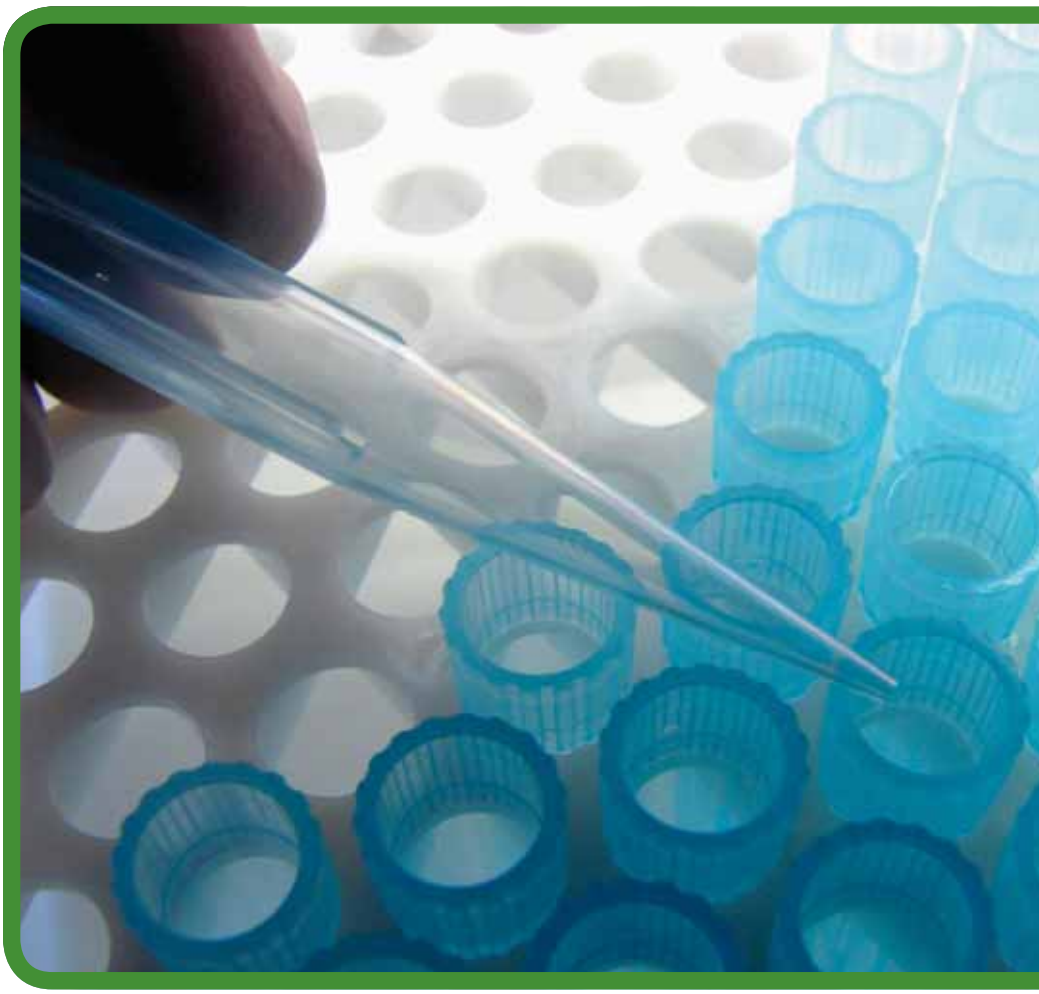
At the same time, VITO is also a key research partner for the respective local, Flemish, federal and European governments, with its researchers giving policymakers the input they need to make scientifically substantiated decisions. Moreover, VITO's researchers give government bodies the means they need to implement policy efficiently and in a well targeted manner.

Looking to the future

At the end of 2007, the Flemish government approved VITO's new management contract, which will run from 2008 to 2012 and was based on what VITO has achieved up to now, whilst also setting out new guidelines for the future.

Accordingly, VITO's management contract and strategic plan for the next few years provide for growth of at least 20% in all areas, including staff budgets, scientific output and patents, among others. This pearl based in the Kempen region justifies Flanders' ambition to become a leading region in the domain of sustainable energy-related and environmental technology.

Karel Goossens,
Research Division



51 See EWI Review (1) 1: 20 – 23.
52 See EWI Review (1) 3: 8 – 10.
53 See p. 16.
54 See p. 18.
55 See p. 37.

Vision of a zero-waste and zero-carbon Flanders

Roughly 35 years ago, in 1972, the Club of Rome published its report entitled Limits to Growth, which initially focused on scarcity, i.e. the fears that the supply of mineral resources would not be able to keep pace with industrial production and that there would not be enough food to feed our planet's growing population. Today, our world is facing a different situation: it has 'limited sinks' and maybe 'limits to waste'.

The preparation of the first Kyoto Protocol on Climate Change and the successive gatherings of experts, scientists and official representatives since 1979, have all been accompanied by considerable efforts in the domains of scientific research and mathematical modelling in a bid to gain as full an understanding as possible into the complexity of climate change. It is extremely important to recognise that the phenomenon is taking place on a non-linear time scale, meaning that the pace of global warming is far more rapid than was thought a few years ago. The melting of glaciers, the poles and the ice cap in Greenland appear to be decisive parameters of our changing climate. The seasonal disappearance of glaciers, as in the Himalayas, will dramatically change the biosphere of four main river basins, with disastrous consequences for the food supply of hundreds of millions of people.

Alarm for the planet's survival?

The concept of an 'ecological footprint' captures how society behaves to meet its needs and above all fulfil its desires. It expresses our industrial society's insatiable hunger for natural resources, resulting in the destruction of our natural capital, which humankind needs to guarantee its own survival. Indeed, humankind will have to reduce its global ecological footprint and restore a safe balance with nature. Put another way, industrial activities on earth must not exceed the planet's capability to accommodate them. Most calls highlighting the extreme urgency of sustainable action have come from scientists and social activists. James Lovelock[56] even speaks of 'sustainable retreat' (as opposed to sustainable development) to ensure that our planet is free of natural disasters and steers clear of irreversible changes. In a similar way, we should probably start thinking in terms of 'negative economic growth' (sometimes referred to as degrowth).

A number of enlightened political leaders, e.g. in New Zealand, are calling for direct action to considerably lower CO_2 emissions. They are even endeavouring to create a carbon-neutral nation and a zero-waste society. The realistic deadlines cited are 2030 or 2040. Furthermore, initiatives by individual companies are leading to minimal-waste or even zero-waste production processes. And more and more initiatives are being taken along similar lines.

From 'Flanders in Action' to a 'Waste- and CO_2-free Flanders'

A socioeconomic action programme for Flanders provides an innovative perspective for how we deal with and develop socioeconomic progress, a desired outcome that is reflected in the following statement: "Flanders must increasingly transform to an innovation-driven economy". Sustainable economies will be innovation-driven economies, based on technologies and industries that are capable of providing solutions for eco- and biodiversity. To this end, a massive reduction of waste and CO_2 emissions has to be managed in a structural way. Clearly, this can be achieved by mobilising ideas on a large scale and strongly motivating the entire population. If that happens, Flanders can become an exemplary zero-waste and zero-carbon region in the EU within the reasonable time horizon of 2030 to 2040.

So what are the prerequisites for the success of such an undertaking? Investments in new industrial production processes, and the creation, development and

installation of renewable energy facilities. Suitable public-private institutions will also be required that effectively accelerate investment in research and development. Finally, the young generation and the remainder of the population need to be acclimatised to 'the new way' and the mindset and actions it entails.

Some inspiring examples

In New Zealand, the prime minister has announced a raft of measures, including plans to increase renewable sources of energy for power generation to cover 90% of the country's requirements by 2025; the halving of CO_2 emissions by the transport sector by 2040; the expansion of forests into areas for carbon sequestration; and "to dare to aspire to be carbon neutral". Of course, simply extrapolating this plan to Flanders would be an over-simplification, even though Flanders shares similar objectives and policy goals.

Closer to home, Denmark has made some major pledges regarding waste and CO_2 emissions. Today, Denmark generates 20% of its electricity from wind farms, but it plans to raise that figure to 50%. According to the Flemish newspaper De Tijd, Denmark has started installing a network for charging the batteries of electric cars and is on track to have installed a basic electrical network by 2010.

A vision for Flanders

Achieving a zero-waste and zero-carbon Flanders by the middle of the century is a realistic proposition. Countries like New Zealand have already announced similar goals. Moreover, such an ambitious objective fits perfectly in the renewed **Flanders in Action**[42] programme, and in a way this proposal is its long-term expression. In this connection, the goals associated with Full Talent – as set out in Flanders in Action – are highly relevant.

A **zero-waste** Flanders will require the support of all citizens. Our throw-away, consumption-driven society is unsustainable. The aim of creating a **zero-waste** society opens up fresh perspectives for the development of goods and industrial production processes. In the long run, Flanders would genuinely and substantially benefit from becoming zero-carbon. All the benefits are really fundamental: the realisation of an export-oriented industrial complex familiar with sustainable technological solutions in the renewable energy sector and a lesser dependency on the supply of fossil fuels from politically unstable areas. Surely these are sufficient reasons to set to work immediately. Flanders in Action, right now!

Raoul Weiler,
Professor emeritus at the Catholic University of Leuven (KUL). President of the EU Chapter of the Club of Rome and Fellow of the World Academy of Art and Science (WAAS)

56 See http://www.kennislink.nl/web/show?id=11293.

The environmental and energy technology innovation platform

Symbiosis between ecology and economy

While the Industrial Revolution triggered a massive surge in economic activities, unfortunately our planet didn't grow along with them, and scientific studies on the environment and energy situation predict a pretty gloomy future if we continue relentlessly down the same path. Unbridled energy consumption is taking a heavy toll on the environment. The list of animal species under threat is growing ever longer and sea levels appear to be rising faster than expected. Future energy supplies are uncertain because the role of nuclear energy is up for discussion and the end of cheap, available oil and gas supplies is in sight. The rising demand for energy, emissions of greenhouse gases and dwindling energy supplies constitute major challenges for the world. Consequently, we need to act in unison to make sure that the environment, energy and economic innovation all combine to make for a sustainable future.

Policymakers are faced with apparently conflicting economic and ecological interests. Combining the environment and energy is mostly regarded as a problem, whereas the challenges we face actually constitute opportunities. Naturally we need to go easy on the environment and be sensible with our energy supply, but if we adopt a creative approach, we can convert seeming limitations into opportunities.

The environment and energy are two domains in which Flanders, with a research centre like the Flemish Institute for Technological Research (VITO[57]), boasts a major asset. But although Flanders can pride itself on expansive know-how in environmental technology, alternative energy and energy saving, its capitalisation on that expertise remains limited. Of course, the problems are complex, so it is imperative that joint action is taken. For that reason, the Flemish government brought together the main actors within the Environmental and Energy Technology Innovation Platform (MIP), where the relevant Flemish governmental bodies (the department of Economy, Science and Innovation together with the department of the Environment, Nature and Energy) are teaming up with businesses, universities and research establishments to look into the development, application and commercialisation of environmental and energy technologies.

MIP's mission and approach

By pooling and coordinating the relevant powers and instruments, the Flemish government aims to provide more opportunities for market penetration in the environmental and energy technology sector.

Consequently, MIP's mission is to continue accumulating know-how in environmental and energy technologies and make sure that it is fully exploited economically and that society makes the most of it. In this connection, MIP is having to come up with innovative solutions to the environmental and energy problems facing Flanders. With this in mind, the Flemish government has earmarked €7 million for the period 2006-2008.

MIP's main focus is on multidisciplinary cooperation and the transfer of knowledge between the respective social actors, so it is opting for a demand-driven approach covering both the development of new technologies and the aspect of making the most of its know-how.

- **Stimulating development through an area of competence**
  To stimulate development, MIP has an area of competence, a virtual research establishment where the participating groups of researchers operate from within their own organisations, with their efforts complemented by a limited number of central functions. Innovation and development are stimulated in strategic domains where there is a clear need in the market. MIP sniffs out fresh opportunities and bundles together the expertise amassed within the area of competence, which then forges ahead with the accumulation of knowledge and its translation into specific applications. MIP then offers support to those groups of researchers who want to initiate projects with companies. These projects are developed in cooperation with the respective consumer groups for the issue in question and financed using MIP funds.

  Individual companies can still receive help via the regular subsidy programmes of the Institute for the Promotion of Innovation by Science and Technology in Flanders (IWT). The projects also benefit from an additional 10% subsidy under the terms of the regulations governing sustainable technological development (STD)[58].

- **Making the most of technology**
  To encourage the maximum exploitation of research, MIP brings all the relevant actors together. In this way, they can coordinate their activities and channel their efforts in a more focused manner. This is part of a horizontal policy that strives for synergy across various policy domains. At the same time, MIP promotes technology transfers by fostering cooperation between research establishments and companies. In this way, knowledge and expertise are shared between the participating research groups and the companies keen on acquiring innovative technologies. After all, new technologies can help companies deal proactively with the ever more stringent environmental legislation and at the same time make their processes more sustainable and more cost-effective. MIP is the central collecting point for all their demands and requirements.

- **Innovative public procurement**
  Public procurement usually takes place by issuing specifications based on well-known technologies. In future, the procuring public authority will make greater efforts to engage in innovative public procurement[59]. This will make room for public calls for tender that not only spell out the results to be achieved, but stipulate that they be attained using technological solu-

mip
Environmental and Energy Technology Innovation Platform

tions that will, to an extent, require development beyond the current status quo. In other words, the innovative component will be part of the project. This also implies the active pursuit of development, with the respective public authority sharing the risk. This instrument should enable companies to bring advanced solutions to market more quickly, with the government stepping up as their first end user.

- **Government regulations**
  MIP has to examine the extent to which government regulations can be 'tweaked' to afford greater opportunities for new, innovative environmental technology. In future, environmental rules and regulations will have to serve as levers for innovation. For instance, the environmental standards to be met, which pose a major challenge to companies, could also generate added value both for the companies themselves and for companies active in the domain of environmental technology.

A thematic approach

For each chosen theme, the area of competence finds a consumer group consisting of representatives of companies, corporate organisations and government organisations. At present there are eight consumer groups active in the energy and environmental domains where VITO is strong. The environmental areas in question are soil decontamination, water management, excavated sludge and waste. The priority energy-related areas involve applications using hydrogen and fuel cells, followed by biomass, energy recovery and the rational use of energy (RUE). For each theme, projects are selected that are designed to stimulate innovation by companies, the main focus being on the demand-driven aspect, depending on the types of innovation sought by Flemish companies. Some 350 companies are involved in the various thematic groups. In addition, around 70 participants at universities, technical colleges and research centres and about 30 representatives of the Flemish government are involved in the consumer groups.

MIP projects

The area of competence is only active for two years. However, seven projects are already under way, receiving financial support totalling €4.2 million from MIP. These MIP projects may also help Flanders to attain the targets set in Kyoto, which is still a somewhat thorny issue. Two MIP proposals clearly illustrate how ecology and economy go hand in hand. In the low-energy technology domain there is an MIP proposal that residual heat stemming from the industrial zone around the port of Antwerp be re-used as a heat source for blocks of flats, greenhouses or other industries. This solution could cut CO_2 emissions by up to 1 million tonnes a year. Moreover, this technology could also be applied to other ports, like those of Ghent, Ostend or Zeebrugge.

Another MIP proposal, this time to do with waste management and recycling, concerns new technology designed to process waste products into building materials. However, substantial research needs to be carried out to ascertain whether the resulting building material would be fully inert and also to make sure that it does not release any hazardous substances into the natural environment. A number of companies are interested in this technology. If the project is a success, even builders as keen as the Flemings will be able to make a positive contribution towards achieving the standard set in Kyoto, since this application would absorb no less than 1 million tonnes of CO_2 every year.

Consolidating MIP's status

Within a very short time, MIP has made a very positive impact on the Flemish environmental and energy-related landscape. The emphasis now must be on consolidating the perception of Flemish expertise abroad and also injecting knowledge and know-how from elsewhere in Flanders. In future, this will be done by linking up MIP to European and international networks, the intention being to foster the international recognition gained by MIP as a knowledge centre for environmental and energy technology.

Karel Goossens,
Research Division

57 See p. 23.
58 See p. 31.
59 See p. 12.

Sustainable Technological Development first

IWT has been implementing the support scheme for Sustainable Technological development (STD) since mid-2002. The objective is to provide extra stimulation for R&D projects geared towards STD. The measure is aimed at one or more of the following innovation-related objectives: reducing consumption of raw materials; saving energy; lowering emissions; reducing waste and damage to the environment; developing renewable sources of energy and raw materials; increasing the recyclability of natural resources; and extending products' life time.

The STD support scheme complements IWT's other subsidy measures and has been integrated into IWT support for corporate R&D projects and into the SME programme. STD projects are eligible for 10% extra support. In other funding channels[60] it was decided to prioritise the selection of projects that contribute to sustainable development.
On balance, at least 20% of corporate projects receive additional STD support, whereas at least 30% of collective projects gain an STD label. These research projects are often geared towards saving energy, ranging from lowering the weight of cars (and thus reducing their fuel consumption) to developing totally new process routes to eliminate stages that consume large amounts of energy.

Other projects focus on saving raw materials, reducing waste or cutting emissions, one example being Deceuninck's solution for recycling more problematic post-consumer waste, such as broken windows, old blinds, PVC drainpipes and building profiles. With IWT's support, Deceuninck developed the Cyclefoam® foam procedure, which uses new extrusion technology to turn processed post-consumer waste back into high-quality profiles (see Figure 3). Projects also frequently involve renewable energy sources and raw materials. Photovoltec has developed an industrial process for manufacturing very thin solar cells. Food packaging specialist ANL Plastics is the first actor in its sector to produce packaging made of various biodegradable materials. In short, Flanders is home to several copybook examples of STD projects that have been supported by the Flemish government.

Figure 3: 1 km of sound barriers can contain recycled scrap PVC salvaged from 450 homes

Veerle Cauwenberg,
Institute for the Promotion of Innovation by Science and Technology in Flanders (IWT)

Table 3: STD subsidies awarded in 2007

Channel of distribution	Number of projects	Total aid in (in millions of euro)
R&D/SME projects	75	4,1 (extra support on top of basic subsidy)
Strategic basic research	4	10,1
TETRA	6	1,7
Flemish Cooperative Innovation Networks (VIS)	17	7,4
Agricultural Research	5	2,9

60 More specifically for calls for innovation involving strategic basic research for universities, TETRA (support to higher education engineering schools for technology diffusion actions), Flemish Cooperative Innovation Networks (VIS) and agricultural research.

CSR and SMEs?

Surely corporate social responsibility (CSR[61]) is just an issue for large companies? Ask the average Belgian for some shining examples of socially responsible companies and their responses are bound to all be multinationals. So what's the CSR situation regarding SMEs?

Federal and Flemish policymakers are advising SMEs to learn all about what CSR entails from large enterprises. So it comes as no surprise that the general public does not associate SMEs with CSR. Nonetheless, entrepreneurs in SMEs are very good in that domain. The key criteria for CSR include positive HR management; the provision of accurate information to, say, bankers or local residents; and respecting the environment. In many areas the situation seems to be just fine.

Pillar of the local community

Many entrepreneurs practise corporate social responsibility without being aware of the fact because they are literally surrounded by people and empathise with the local community. Such business people know their neighbours and are often active in local associations or school committees, chairing or helping to run them. Not infrequently they play the role of main backer. How many entrepreneurs do not keep their local football team going, sponsor or organise art exhibitions, give away free products to youth movements, attend a camp or provide the transport for tents and equipment? How many grocers or supermarket managers buy lots or sponsor posters of student parties? A recent UNIZO study showed that an independent shop owner will spend an average €1,500 a year on sponsoring. That statistic says a great deal.

These entrepreneurs also know the personal situation of their staff and sometimes help and/or advise them in the event of family problems. They maintain very direct relations with their clients, and if a problem arises they can be reached in person, eliminating the need for intervention by an ombudsman. Moreover, customers don't have to phone a distant call centre with an anonymous customer or complaints service to voice their grievances.

The only problem is these entrepreneurs don't write books about it and don't build any PR campaign around their efforts on behalf of the environment, HR management policy or good neighbourly relations. SMEs simply practise CSR without making a big song and dance about it. What makes SMEs so special is that personal accountability and official responsibility converge and their economic relations are also human relations.

If it's on paper, it's real

Certificates and labels are frequently used to showcase CSR-related efforts. Here, too, large companies are far more active than SMEs, which often lack the resources to keep paper records of their CSR-related activities and thus acquire a label. And it is precisely for this reason that they stay confined to the shadows. Nonetheless, SMEs frequently base their actions on their own values. Not that long ago, one of our managers expressed his vision in the following way, working in "a company where human values prevail, based on mutual confidence in relations and focusing on a meaningful objective, fostering human development, making a positive contribution to society and respecting the environment". Such an attitude most probably explains SMEs' aversion to labels and certificates, which they find difficult to gain (and retain) because the stipulated procedure often clashes with their way of doing business. After all, it takes great flexibility to adapt to customers' constantly changing questions.

Owners of SMEs want to make their business work and at the same time do their best for society. But don't ask them to put that down on paper and develop 'systems'. Don't harass them with paperwork; they aren't cut out for it. We need to ask ourselves what the added value of all this bureaucracy is: specialised companies become richer and a mountain of paper is generated to comply with what the company demands, as it were. The importance attached to labels and certificates is in keeping with the widespread view that what has not been 'bureaucratised' quite simply does not exist. We also come across this principle elsewhere. Whizz kids make sure that everything on paper is OK so that 'everything is in order'. But the reality is often completely different. Recently, Senator Hugo Van den Berghe of the Flemish Christian Democrats (CD&V) made an interesting remark when he said that "the scope of a society's decadence can be measured by the extent of its bureaucratisation". The example he cited was the Austro-Hungarian Empire "which bureaucratised so very much in order to distract people from its own decadence". To which we can only add that history regularly repeats itself.

SMEs distrust the media

Many misconceptions can be explained by how the press reports on corporate social responsibility. Just recently, the Sustainable Business Award was bestowed on Ecover[62] and the press duly paid extensive attention to this winner, an actor that is becoming increasingly important and for whom we have a great deal of respect. Ecover is a growing family SME which shows that even detergents that cause less damage to the environment can be marketed successfully.

But the press failed to report that at the same time a company with just five staff bagged the Sustainable Business Award in the category of companies with fewer than 10 employees. Nonetheless, the honoured photo laboratory, Asap Photographic Services, is a pioneer in its sector, reducing waste from its production water by using the cleansing power of a small field of cane on the roof of the company and thus doing its bit in a rather special way to improve the environment. But not only is it a well-known fact that one man sows and another often reaps; at the same time SMEs unjustly tend to mistrust the media, a world with which they aren't familiar. What's the best way of trying to change this? Using the media far more than in the past, and in all openness, to share such shining examples with large sectors of the public.

SME guide

An organisation like UNIZO can play a role here by responding to such widespread misconceptions regarding SMEs' CSR. For that reason, we have published a practical guide that starts out with the problems faced on a daily basis by the managers of SMEs, to which they are seeking sustainable solutions. The guide is intended to systematically induce entrepreneurs intent on attaining their economic goals to also shore up their ambitions in the environmental and social sector, building on good relations with all stakeholders.

The approach advocated in the guide is based not on theory, but on specific business practice, being the product of interviews conducted with more than 300 SME managers, a number of whom are even cited personally in the CSR guide. They reveal how a self-employed entrepreneur can constantly take account of social issues without losing sight of their company's most important (i.e. economic) objective.

SMEs, CSR and the need for greater visibility

I'm in good company with my vision of the high CSR content of SMEs' activities. For instance, Luc Van Liedekerke of the Centre for Economy and Ethics at the K.U. Leuven is constantly defending the view that it is SMEs, above all, that are playing a pioneering role with respect to taking CSR on board.

The conclusion we reach from all this is simple: if there is a problem, it is one of visibility. Entrepreneurs themselves find that what they do is nothing short of self-evident. That also applies to their environment. Everyone regards the CSR-related efforts made by local entrepreneurs so normal that they are no longer perceived for what they are and therefore remain underestimated. So we believe it is important to highlight this aspect of SMEs more prominently. We need to get the message across that self-employed entrepreneurs are more than important creators of jobs or contributors of fiscal and parafiscal revenue. They are key pillars of our society.

Taken from Winst voor welvaart, over entrepreneurs zonder taboes *(Profit for Prosperity: About Entrepreneurs With No Taboos), by Karel Van Eetvelt, Managing Director of UNIZO, the Union of Independent Entrepreneurs.*
ISBN 978-90-5826-521-0


Picture Dann

61 See p. 16.
62 http://www.ecover.com.

To thrive, the bioeconomy needs policy support

In 2005, the OECD launched a project aimed at drawing up a policy agenda for governments based on the bioeconomy[63]. The bioeconomy is a new concept referring to various economic activities based on the explosive increase in knowledge and insights derived from the biosciences. The main questions arising here are how quickly new biotechnological applications are being taken up, how the situation might develop over the next 20 to 30 years and what the socioeconomic impact might be.

In the meantime, the project report, which numerous prominent experts have helped to produce, is almost finished. At regular intervals the OECD member states were consulted. This approach guarantees a high degree of consensus and objectivity. The challenges which the bioeconomy is facing have also been listed by the European Commission[64]. It has been forecast that the world population will grow by 28% to 8.3 billion by 2030. Worldwide, prosperity is rising but the population is also growing older. In such a context, the demand for energy, water, healthcare and food will go up significantly. Growing prosperity also means rising demand for meat, necessitating an additional increase in agricultural production. Barring a catastrophe of some kind, there is no way back. Biotechnology is essential for the sustainable development of the bioeconomy and is impacting on agriculture, health and industry.

The challenge faced by agriculture is to meet this higher demand for food and biomass, not just for fuel, but also for the development of a chemical industry based on sugar chemistry instead of carbon-based fossil fuels, like petroleum. Furthermore, a changing climate may cause fresh sources of stress for crops, including heat, drought and cold, quite apart from bringing new diseases to areas from which they were previously absent.

Furthermore, over-production is leading to the depletion of the soil and piling the pressure on land available for agriculture. Only by using the latest methods of cultivation methods and genetically modifying plants and crops we will be able to meet our needs. The opposition in Europe to genetically modified (GM) is only having a marginal effect on their global use, leading only to Europe's isolation and loss of market share in this sector. The use of GM plants in European agriculture is best considered on a case-by-case basis, using strict scientific criteria, not emotional arguments.

The competition for foods and fuel production is affecting the food supply and pushing up food prices. Question marks can be raised about our objectives with biofuels when their yield, production costs and combustion efficiency are subjected to a full analysis. Research into 'next-generation biofuels' and other plants/organisms that do not compete, or at least only do so to a lesser extent, with agricultural land and food production remains important. However, for now such research is still at the experimental stage. All policy initiatives must give due consideration to the full cost analysis of the production process and also combustion efficiency. Only an integrated approach involving every possible alternative to fossil fuels will enable us to meet our energy needs and food requirements. In this context, we must at least discuss controversial solutions like investing in the latest generation of nuclear energy.

Structural changes are necessary in the health sector if biotech is to make a decisive impact. Still, our knowledge and potential applications based on biotech are growing exponentially. One of the main barriers is regulation and the associated costs of developing new methods and drugs that companies will subsequently have to earn back. Costs arising in connection with the development of new applications for developing countries, in particular, are disproportionately high. Ultimately they will bring research, and thus innovation, to a halt. Just as in agriculture opposition to GM plants hampers innovation and sustainability, the same applies to ethical reservations against, say, the use of stem cells. Policy can help to facilitate the introduction of innovative sustainable technologies that serve society's needs.

Although there are many domains in which Flanders is among the leaders, an analysis of the latest developments in the bioeconomy pinpoints some weak areas as well. Internationally integrated collections of tissue and cells open up tremendous prospects for health, yet Flanders is currently relatively inactive in this domain. Collections of various organisms can also help to maintain biodiversity and the use of more natural properties in agriculture and livestock production. After all, the natural gene pool far outstrips what is used in selection breeding. Some wild varieties boast special properties, such as natural resistance to diseases, extreme growth conditions or special taste-related properties. The importance of this is illustrated by a fungal infection that is currently having catastrophic consequences in banana cultivation[65]. The banana collection kept in Leuven may offer a solution here, since some varieties of banana are naturally resistant to the fungus in question. Research into the key factor underlying resistance and how it can be used in cultivation could avert an economic disaster. This underscores the importance of such collections and of biotechnology. The development of specific and cheaper biotech methods to meet the needs of developing countries, including with respect to the environment, may constitute part of development cooperation policy. New, up-and-coming technologies could speed up the development of the bioeconomy, provided that they are taken up quickly enough (e.g. synthetic biology[66], which entails the development of new biological systems for special applications, starting out from so-called biobricks[67], blocks of DNA that determine basic biological functions, a bit like Lego bricks).

Biotechnology will exert mounting influence over health, food, land use, energy, biodiversity, ecology, quality of life and the sustainable use of natural resources. How successful the bioeconomy turns out to be will depend on how well it breaks through into various sectors and a wide range of areas of application. Suitable framework conditions need to be created if it is to have a major socioeconomic impact, including the stimulation of research and development, appropriate regulations, market opportunities, a sufficient number of highly trained people, and appropriate financing possibilities. A stimulating policy will make optimal use of the opportunities stemming from the bioeconomy with respect to sustainable developments for society, the economy and the environment.

Kathleen D'Hondt,
Research Division

63 http://www.oecd.org/department/0,3355,en_2649_36831301_1_1_1_1_1,00.html.
64 ftp://ftp.cordis.europa.eu/pub/fp7/kbbe/docs/about-kbbe.pdf.
65 http://www.vilt.be/nieuwsarchief/detail.phtml?id=17992.
66 http://syntheticbiology.org.
67 http://www.biobricks.org.

Clean development

Stefaan Vergote on European climate policy

"Rising oil prices have exposed the vulnerability of our economy with respect to fossil fuels."

EWI Review: Can you tell us what your organisation and department do and how your activities impact on Flanders and the Flemish economy?

Stefaan Vergote: "Our department is working on the integration of energy and climate policy. Some people are focusing on energy or climate modulation, analysing the economic and ecological impact of climate policy. The eternal question being asked is what the costs and benefits of proposals being developed are. Our department plays a key role in analysing the impact of international climate policy at both the sectoral and national levels.
In addition, we deal with specific energy and climate policy issues. Among other things, we are responsible for the proposal on so-called carbon capture and storage (CCS[69]). One part of the European climate package is a proposal to define the criteria under which carbon capture and storage can take place and adapt the relevant legislation on the basis of these criteria. We need guarantees that CCS will take place in an environmentally friendly manner: for instance, there must be no leaks.
We are also responsible for distributing the burden imposed by the climate package between the Member States in those sectors not subsumed by the emission trading system[70]."

An inconvenient truth and an inconvenient plan?

EWI Review: European Commission President Barroso unveiled this climate plan at the beginning of the year. What are its main priorities?

Stefaan Vergote: "Over the last few months, the level of concern over the climate problem has risen, partly due to Al Gore's film (*An Inconvenient Truth*[71]) and the reports published by the UNFCCC[72], which attracted a great deal of attention in the press. Today, the public and politicians understand that the problem urgently needs addressing. Rising oil prices have exposed the vulnerability of our economy with respect to fossil fuels, especially oil and gas. What's more, the consensus has been growing that such problems can only be dealt with at European level.
The Commission first proposed some strategic goals: (i) to reduce greenhouse gas emissions by 20%, and in the framework of an international agreement possibly by 30%; and (ii) to reach a binding agreement to raise the share of renewable energy to 20% by 2020[73]. In March 2007 the heads of state and government of the EU Member States signed up to these strategic goals. They explicitly requested the Commission to draw up specific plans on how the Member States could share the associated burden. The Commission then spent the next year working on a number of specific, integrated proposals."

> Viewed at European level, we are not yet among the leaders. If that is what we want to achieve, there will have to be a change of mindset.

EWI Review: Namely?

Stefaan Vergote: "Firstly, the renewal of the emission trading system, which necessitates a proposal on how the Member States can share the burden in those sectors not subsumed by it. Secondly a proposal for an integrated directive on renewable energy, again with the Member States sharing the load. A third proposal concerns new technology, i.e. carbon capture and storage. The various elements of this technology already exist and work in practice, yet the full chain between the generation of electricity, carbon capturing, transportation and storage has never been demonstrated in its entirety. The key here is to guarantee environmental integrity[74]. That is absolutely essential if we are to succeed in commercially exploiting such a system."

Selling air

EWI Review: One of the elements in the climate package is the trading of emission rights. This is a considerable cause of concern, especially in industry. Is that concern justified?

Stefaan Vergote: "If we want to get to the root of the climate problem, the ETS offers a unique chance of reducing CO_2 emissions. After all, it gives companies the freedom to do their bit in their own way, taking decisions and developing their own strategy within a global framework.
At the same time, we've taken account of the impact on prices of CO_2, their potential development and how we can keep them within certain limits. For instance, there is the possibility of involving the credits of third countries in the system: a kind of invitation to go ahead and sign up to an international agreement. Only through an international agreement can we make a major contribution to technology transfer and the use of such credits. At the same time, there is also an internal reason. If no international agreement is reached, carbon prices will drop very low, with the result that there will be no reduction of emissions in Europe. This would also preclude the additional advantages associated with energy efficiency, so we have also sought to factor in that effect."

Will this place an additional burden on companies?

EWI Review: So on top of the high cost of labour there will be a technological cost, with additional obligations and red tape. Isn't there a danger of even more companies relocating to places where it is easier and cheap to do business?

Stefaan Vergote: "Our proposals obviate that problem. The best way of dealing with this question is effectively to reach a global international agreement that makes other countries also implement appropriate measures. That would result in more balanced relations between

We have to prevent the major trading blocs from reproaching

ronmental measures and technological requirements are being

companies internationally.
If no international agreement comes about, we will have to review the situation. In this context, we have proposed various options, such as under certain circumstances increasing the number of free emission rights for energy-intensive companies and the possibility of introducing charges to on energy-intensive products from third countries that are to be brought into the ETS. After Copenhagen we will re-evaluate this provision in the proposals."

Clean together

EWI Review: Will a follow-up agreement to the Kyoto Protocol be drawn up in Copenhagen?

Stefaan Vergote: "Copenhagen is the venue for next year's international climate conference. We have to prevent the major trading blocs from reproaching each other, claiming that the new environmental measures and technological requirements are being applied or 'played' for protective reasons. That is a very real problem. So we can only proceed to evaluate specific measures after an international agreement has been reached, or after Copenhagen. It would pose a major problem if this was already seen as possible protectionism and could result in failure to reach an international agreement, because such an agreement must be given every possible chance of succeeding."

EWI Review: How do you rate the chances of a decent agreement being reached?

Stefaan Vergote: "Over the past few years a slow, but sure perceptible shift has occurred in Europe and other parts of the world. China is a good example. The government there understands that it will face very major problems regarding energy and the climate, and China is also drawing up specific plans. So Europe is not the only bloc busily adopting measures. At the same time, next year the situation in the United States will be different. All the candidates for the US presidency have clearly stated that a great deal of work has to be done on energy and climate policy. So we have a chance to make some important headway."

Flexible mechanisms

Countries first have to attain their emission targets (2008-2012) by adopting measures at national level. The Kyoto Protocol (1997) leaves it up to them to apply additional resources in a bid to attain their goals with respect to greenhouse gas emissions. Industrialised countries can use three 'flexible market mechanisms' to reach their targets regarding emissions:
- The emission trading system (ETS);
- Joint Implementation (JI) (projects between parties bound by the Kyoto Protocol that also have national emission targets);
- the Clean Development Mechanism (CDM) (projects in developing countries without targets).

What is the reasoning behind these three mechanisms? Greenhouse gas emissions pose a global problem and where reductions are made is not important. JI and the CDM enable reductions to be achieved in places where the costs of combating climate change are lowest, at least to begin with.

The European companies involved in the European Union's emission trading system (ETS) can use credits from JI and CDM projects to meet their obligations under it. In turn, governments can use credits from JI and CDM projects to meet their obligations under the Kyoto Protocol.

Meanwhile, back in Flanders

EWI Review: Wherein lies the greatest challenge for Flanders in your opinion?

Stefaan Vergote: "I think the key challenge facing Flanders is in the transport sector and the logistical switch to a sustainable transport system. We are all aware of the problems with transport in Flanders, which is a very densely populated area with ports, airports and motorways. How can we move towards a sustainable transport sector? That is a very difficult question."

EWI Review: In this context people are talking about challenges, but also about opportunities. Where do you think the greatest added value can be achieved in the context of climate policy?

Stefaan Vergote: "There are opportunities in technology and energy efficiency in virtually all sectors. In the construction sector there are major opportunities for consumers to sustainably and in the long term become less dependent on oil and gas prices. At the same time, the building trade can create more jobs and play a leading role in developing new technologies. The sector may be somewhat traditional, but there is plenty of scope for innovation. Companies should be able to develop a number of new technologies that can subsequently be applied in third countries as well.
Then there is everything to do with technology. I think the main knowledge centres are involved with microelectronics, domotics and solar cells. Such knowledge centres can provide spin-offs which could become major players in Europe in the longer run. In the 1980s, Flanders was a leader in wind energy, but it lost that momentum. Now we are seeing the big multinationals active in the wind energy sector in those countries that persevered with their policy of subsidising wind energy over a 20-year period. In other technologies, like solar cells and fuel cells, today we have companies and knowledge centres, but need a sustained policy geared towards furthering their development over the next 20 to 30 years. I believe a very major effort is required in this area."

each other, claiming that the new envi-

applied or 'played' for protective reasons.

How sustainable is the Flemish economy?

EWI Review: How well is our economy doing in terms of sustainability and to what extent is it already taking on board the climate package you described above?

Stefaan Vergote: "A number of companies are on the right track. For instance, in the wind energy sector, despite the lack of any long-term policy, some companies have become important, turning out gear units, transformers and so on. But viewed at European level, we are not yet among the leaders. If that is what we want to achieve, there will have to be a change of mindset. The government must move swiftly to take a number of important steps."

EWI Review: Do you have any recommendations or suggestions for Flemish politicians?

Stefaan Vergote: "It's important to lay foundations for the future. I believe we've now reached a point where the respective social actors are aware of the opportunities arising. If all the relevant players are brought together around the table and the policy developed takes on board the stakeholders' own ideas, this will lay the necessary foundations. Incidentally, that is what we're doing in Europe with the European Climate Programme. I'm aware that some people are already working on this, but it's important to take the first step."

Frank Vereecken and Peter Spyns, Strategy and Co-ordination Division

68 See http://www.europa-nu.nl/9353000/1/j9vvh6nf08temv0/vhesf063wxu9

69 See http://www.europa-nu.nl/9353000/1/j9vvh6nf08temv0/vhsiblpaitz9?ctx=vg9pjk198axu&start_tab0=60 for an extensive explanation of carbon capture and storage.

70 See http://www.emis.vito.be/ShowPage.cfm?PageID=45&News_ID=1107 for more information on the emission trading system.

71 http://nl.wikipedia.org/wiki/An_Inconvenient_Truth.

72 United Nations Framework Convention on Climate Change: See http://unfccc.int/2860.php.

73 See p. 13.

74 Licensed operators must show due diligence by adopting the necessary measures and, based on the necessary monitoring and reporting, ensure that carbon is stored safely.

75 See p. 23

Stefaan Vergote is Deputy Head of Unit of the Energy and Environment Unit at the European Commission's DG Environment. He is involved in drawing up and negotiating European climate policy in the context of a new climate agreement after 2012[68]. In addition, he has worked with the Emissions Trading Unit on the Emission Trading System (ETS) which is due to enter into force after 2012.

Stefaan Vergote gained a degree in electronic engineering at the Catholic University of Leuven (KUL), where he spent two years as a researcher before switching to IWT as a scientific advisor in the domain of electronics, information technology and environmental technology. Before joining the European Commission he spent another year conducting research at VITO[75]. His first job at DG Enterprise (unit F5) concerned environmental standards (including noise pollution and exhaust gases).

The Policy Research Centre for Sustainable Development

Nowadays, it's virtually impossible to imagine the news without any mention of sustainable development, yet 15 years ago hardly anyone had heard the term, which has now become a real buzzword. As oil prices shoot up and there is much talk of climate change, everyone is talking about saving energy, CO_2 emissions, particle filters, and so on. However, sustainable development has to do with far more than just environmental issues. Development cooperation, fighting poverty, fair trade, working conditions and corporate social responsibility are just some of the many sub-themes of sustainable development.

Alongside these many sub-themes, sustainable development is also characterised by the involvement of many, if not all, social groups. The government alone cannot ensure that our society suddenly becomes sustainable. Every single one of us will have to do our bit. We are all consumers: we all feed ourselves, move about, work, relax, travel and participate in cultural activities, and the choices we make in so doing have a massive impact on the sustainability of our society. Companies are also important, owing to their role in the economy, the jobs they provide, transport, their use of raw materials, and energy and emissions of pollutants. The government also plays a major role, as an employer, policymaker and role model for others.

Stakeholders and levels of policy

Alongside these three general groups, a larger number of social stakeholders each contributes to realising or failing to achieve sustainable development. The most important of these other stakeholders involved with (international) sustainable development policy are environmental organisations, development organisations, industry (and sectoral federations), employers' and workers' organisations, consumer organisations, farmers, associations for youngsters or older people, local authorities, cultural minorities, scientists and women's organisations.

The degree of involvement of various policy levels is extremely important. Sustainable development came about in an international context, but is relevant at every level, from local and municipal to provincial, national, supranational and international levels. When policy is applied in such a broad geographical context, its implementation is referred to as multi-level governance.

A small, but forceful policy research centre

The Flemish government has taken on board the growing importance of sustainable development and thus made it a key political issue. Accordingly, Flanders now has a minister of sustainable development (added to the portfolio of Flanders' minister-president), a decree on sustainable development, a Sustainable Development Unit, a Flemish Strategy for Sustainable Development and an official cross-policy Working Group on Sustainable Development. So the Flemish government's decision to also set up a Policy Research Centre for Sustainable Development as of 2007 is totally in keeping with its approach up to now.

Although it is one of the smallest policy research centres for policy-relevant research (comprising 4.5 researchers a year), the research it does is conducted by around eight researchers. Its mission is to enable the Flemish government to turn sustainable development into a full-blown policy domain and area of policy.

Three main clusters

The research carried out by the policy research centre is divided into nine projects, accommodated in three content-related clusters. The first of these, Governance for Sustainable Development in Flanders, analyses sustainable development policy from the viewpoint of its institutions and dynamism. It attends to the organisation of sustainable development as a policy domain, to the interaction between government and civil society (so-called 'multi-actor policy'), and also to the relations between the Flemish government and other levels of government, whether active at a level that is lower (municipalities and provinces) or higher (the EU, the United Nations). Finally, it keeps an eye on interactions with the federal level and on the thrust of any development in Belgium's other Regions and Communities.

The second cluster, Sustainability in Flanders: System Innovation and Transitions, focuses on two policy approaches that have gained considerably in importance over the last few years. The challenges facing our society today are so severe that some experts believe far-reaching changes (so-called 'transitions') are necessary if we are to find a solution. This cluster investigates key potential angles of attack with regard to both the theoretical aspects and applications of system innovation and transition management.

The third cluster, Instruments for Sustainable Development, scrutinises a number of policy instruments by looking at what fiscal policy can do for sustainable development and by clarifying the instrument of sustainability assessment. In a subsequent phase it will also analyse sustainable management systems.

The aim of the policy research centre is to provide support for the fledgling research domain of sustainable development by providing critical analysis, answering policy-oriented and social questions and contributing towards the social debate in Flanders.

Kris Bachus en Hans Bruyninckx, Policy Research Centre for Sustainable Development

Name: Policy Research Centre for Sustainable Development
Promoter/Coordinator: Professor Hans Bruyninckx
Consortium members: : - University of Ghent Centre for Sustainable Development
- Free University of Brussels (VUB) Human Ecology Department
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- Flemish Minister for Institutional Reform, Ports, Agriculture, Sea Fisheries and Rural Policy

Budget: € 450,000

Can doing environmentally friendly business make money?

Since Al Gore's documentary film 'An Inconvenient Truth', everyone has been aware of the problems associated with global warming. The Flemish government, too, believes it is important to take care of the climate and the environment, which is why it decided to offer businesses support in the form of an ecology premium.

This ecology premium, which is intended to enable companies to organise their production processes in a more environmentally friendly, low-energy way, was thoroughly reformed in 2007. Owing to the success of the measure (demand for aid easily exceeded the available budget), on 16 May 2007 the Flemish government decided to organise ecological support as competitive calls for applications using a closed budget system (i.e. offer a fixed amount of funding per application).

How to sign up

Each year sees the organisation of three calls, to which companies can submit an application (one per call) for a planned investment. The applications received are objectively assessed and then ranked in order of merit. The total of available subsidies (€25 million) is divided up between the best-ranked investment projects until the budgetary envelope is used up. The ecology premium amounts to 10% for large companies and 20% for SMEs. The maximum amount of support available for a single application is €1.5 million. The support provided is calculated on the basis of the additional environmental costs of the eligible components of the investment.

What kind of investments are eligible for support? The list includes around 150 technologies and contains a description of the technology, the additional environmental costs, the eligible components of the investment and the performance factor. The performance factor indicates the extent to which the technology in question helps to achieve Kyoto objectives or implement the Flemish government's environmental policy plan.

As from 1 January 2009, a total annual budget of €120 million will be available for ecological investments in companies. The conventional investment support for companies, better known as the growth premium, will be scrapped as of next year, and the budget set aside for it (€45 million) will be added to that of the ecology premium. At the same time, the percentages of support provided and the maximum amount available per application will go up.
Large companies will now be eligible for 20% (rather than 10%) support and SMEs will be eligible for 40% (up from 20%). In addition, the maximum amount of €1.5 million for a single application will be raised to €1.75 million.

Want to know more about the ecology premium?

For more information, consult the website **www.vlaanderen.be/ecologiepremie**, where applications for the ecology premium can be submitted electronically.

By way of an example: sustainable Colruyt

The Belgian family-run company Colruyt was founded back in 1925. Down the years, the small company grew into a major discounter in the food and non-food segments, and now employs over 17,000 people and runs more than 200 stores throughout the country. Gradually Colruyt came to understand that a company can only continue growing if it does business in a sustainable manner. So in addition to its economic objective of generating profits, it is mindful of the need to pay attention to ecological and social aspects as well.

Accordingly, in 1990 Colruyt launched its Green Line environmental programme, under which the company's executives and employees at all levels pledged to do what they could to work in a more environmentally friendly way and take environmentally friendly initiatives. In the meantime, Colruyt's commitment has borne fruit, both regarding waste (prevention, recycling and re-use) and the rational use of raw materials and energy (plain stores, efficient lighting and heating). The motto of the programme is '*The greenest energy is the energy you don't consume*'. Moreover, Colruyt has invested in renewable sources of energy, erecting its first windmill in 1999, followed by a second in 2006, and installing solar panels in Ninove and Halle. Some of these developments have been subsidised by the Flemish government (see box).

Colruyt says that the financial support offered by the Flemish government served as an important stimulus to set the ball rolling, helping to tip the balance in favour of the approval of certain investments by the company.

Colruyt is currently setting up windmills in Ypres. In future the company also plans to build a marine wind farm (Eldepasco). Its ultimate objective is to equip as many shops and distribution centres as it can with solar panels so that the company can become fully self-sufficient in energy within roughly 10 years.

Sophie Callewaert,
Entreprise and Innovation Division
with Koen De Maesschalck from Colruyt

colruyt

A few figures

1999: distribution centre in Halle: windmill
(generating an average 1,849,109 kWh per year)
- cost of investment: €1.4 million
- amount of demonstration subsidy awarded[76]: €247,893.52

2006: distribution centre in Halle: investment in a solar energy installation
- investment: 8,000 m2 of solar panels (generating 250,000 kWh per year)
- cost of investment: €1.5 million
- awarded ecology premium: 25% subsidy on an accepted additional environmental cost of 70%

2007: the first solar-powered Colruyt store (in Ninove)
- investment: 570 m² of solar panels (65,000 kWh per year)
- cost of investment: €390,000
- awarded ecology premium: 25% subsidy on an accepted additional environmental cost of 70%

76 Demonstration support is a subsidy specifically awarded by the Flemish Energy Agency for innovative renewable energy technologies in Flanders – see **http://www.energiesparen.be**.

Students and learning how to do sustainable business

Entrepreneurship is one of the priorities of the Flemish government. Since too few Flemings are still opting to become entrepreneurs, the government has devised a policy to encourage budding entrepreneurs to take the plunge. Education has an important role to fulfil here because the explosion of knowledge and the acceleration of technological developments have merely deepened the gulf between the world of education and businesses.

For this reason, the Flemish government wants to shore up the cooperative links between education and the world of business by encouraging schoolchildren to adopt an entrepreneurial mindset. It is doing this by issuing a call for bridge projects between businesses and education, a joint initiative taken by the ministers responsible for the economy and education, who are offering financial support for projects designed to raise awareness or emphasise how to acquire the attitudes, competence and skills that stimulate entrepreneurship.

The call for bridge projects between businesses and education is organised on a competitive basis. Selected projects receive a maximum of 50% support, limited to €250,000 per project. The remaining 50% has to come from the private sector. Calls for applications were issued in 2003 and 2006, resulting in the awarding of subsidies to 17 out of 33 and 14 out of 32 applications respectively. The second call for applications was specifically aimed at 'doing ethical and sustainable business' and 'doing international business'.

Two projects two years down the line

'PURO' and 'ResponsabiLeren' (Responsible Learning) were two of the subsidised projects on 'doing ethical, sustainable business'. So how are these projects faring almost two years after their launch?

1. **The PURO project** arose as an initiative of the Department of Commercial Science and Business Administration of the Catholic College Kempen (KHK), in cooperation with the local economy unit of the city of Turnhout and the company Miko. It was the top project selected in 2006.

The project concerns the introduction of a fair trade coffee called PURO in the non-profit sector. After the start of the project, various workshops and training courses on the marketing of a sustainable product were organised. Then the students were left to apply their theoretical knowledge in practice. In 2007, the college students drew up a business plan based on surveys conducted among municipal authorities. The results indicated the best way of approaching the non-profit sector to sell sustainable products.
In a subsequent stage, the students developed a marketing plan that took account of the surveys' findings. This exercise was carried out by final year secondary school students via a mini-company, supervised by marketing students from the KHK. Finally, PURO coffee was positioned in the market via an appropriate communication campaign.
May 2007 saw the launch of an awareness-raising campaign designed to stimulate sustainable business. In addition, a two-day practically oriented conference called Trading Minds (*www.tradingminds.be*) was

held to discuss the relationship between marketing and doing sustainable business. That congress was put together by the students themselves. At it, they presented the PURO project as a practical example of how to do sustainable business.
In fact, sustainable business was at the heart of the entire process, not just with respect to the choice of the product, but also in the communication and marketing. At the same time the project also involves doing international business, for after the start-up in Antwerp it went on to spread further, both within Belgium and into neighbouring countries. So two years after the start, the PURO bridge project seems to be delivering the hoped-for win-win situation for all three parties involved.

2. **ResponsabiLeren: Leren voor een Duurzame Toekomst** (Responsible Learning: Learning for a Sustainable Future) - is an initiative of European University College Brussels (EHSAL), a partner in University College Brussels (HUB), in cooperation with the Centre of Informative Play (CIS), Halma and the Flemish Association of Christian Employers (VKW).

By developing a new informative game they want to spotlight ethical and sustainable business more effectively. The game familiarises pupils, students and entrepreneurs with corporate social responsibility[77] and then explores the topic in a playful, but didactically responsible way that makes it very clear precisely what CSR is all about and sensitises the target group to the associated problems.

Two years later, the basic concept has been developed into a new informative game. Various test groups have evaluated it in depth and made adjustments where necessary. The promotion of the game is due to get under way soon. In a next stage, a minimum of 100 college students, 50 pupils and 50 entrepreneurs will try it out in practice. Once it has been assessed, the game will be included in the relevant syllabus or in the courses offered by the organisation in question.

Watch this space ...

In view of the great success of the previous calls for projects, on 7 May 2008 a third open call for applications was launched, this time focussing on 'doing technological business in lower and pre-school education' and on 'coordination and cooperation between existing initiatives on business education'. A total budget of €2,5 million has been earmarked for this. More than 20 proposals have been submitted.

Els Vermander,
Strategy and Co-ordination Division
André Meyers,
Economic Agency, Department of Economic Subsidy Policy

Want to know more?

Then come along and play with the Economy Agency on 20 November 2008 at the third session of the Flemish Entrepreneurship Promotional Network (VON) at the Hotel Metropole in Brussels. No economic knowledge is required! For more information, call André Meyers on +32 (0)2 553 35 19.

77 See p. 8.

ResponsabiLeren (Responsible Learning)

PURO coffee

Open innovation: a potential guide for rethinking innovation policy

Open innovation[78] is gradually accepted by innovative companies as an a new paradigm to increase R&D productivity and (re)gain competitiveness. Rapid technological developments, increasing globalisation, heightened competition by small, innovative players, and mounting creativity in experiments with new business models are forcing more and more companies – including large enterprises – to speed up and improve the innovation process. To this end, they are assimilating and integrating in their own R&D activities innovations that were developed by other organisations. Philips, IBM, P&G, Bekaert, Solvay and other large companies are all on the lookout for externally developed technologies and ideas that they can turn into profitable commercial applications within their own business model. In this endeavour, their potential partners include universities, research laboratories, innovative starters, lead users and alliance partners.

Apparently, open innovation is the playing field offor companies and researchers, with seemingly no role left for government to play there. However, recent research shows that policymakers can play a crucial role in stimulating open innovation. The research project in question entailed cooperation between Henry Chesbrough of the University of California Berkeley, Wim Vanhaverbeke of the Hasselt University), Jeroen De Jong from EIM Business and Policy Research in the Netherlands, and Estonia's Tharmo Kalvet. The project, dubbed the Open Innovation Policy Assessment Framework (OIPAF), was funded by VISION ERA-net[79]. In their report, the researchers set out a framework for policymakers to rethink their innovation policy based on the fundamentals of the open innovation paradigm. The framework derives its innovative nature and relevance to policy from combining two dimensions, which raises a number of points for policy makers to rethink innovation policy using open innovation principles.

Two dimensions ...

The basis for the first of these dimensions is a series of social developments and changes in how companies manage innovation based on an open innovation strategy. Here we will limit ourselves to touching on a few of the major changes dealt with at length in Chesbrough's books:

- Knowledge workers are becoming more and more mobile, yet rigid national labour laws imply that the mobility of labour in most European countries is still far from optimal. This lack of mobility is reflected in an insufficient flow of knowledge between the researcher and business communities, but also in limited geographical mobility in Europe.
- Universities and knowledge institutions are constantly becoming more important for innovative companies, and it is important to make the best possible use of this knowledge.
- Scientific and technical knowledge is no longer monopolised by the wealthy West: innovative companies will have to internationalise their R&D activities more and more.
- The venture capital breakthrough is enabling small companies without financial resources to become serious challengers of large companies.

The framework's second dimension provides a number of policy principles that can stimulate companies to practise open innovation by:

- Fostering the development and mobility of highly qualified staff within a company.
- Creating and supporting institutions that make financial means available for promising ideas and business models.
- Protecting intellectual property in a predictable and reliable, but limited way, so that a maximum number of companies can benefit as a result.
- Ensuring that the government not only directly encourages fundamental research, but also stimulates indirect innovation (for example by getting to grips with intellectual property, implementing an appropriate starters' policy, and so on).
- Focussing attention not on specific companies, but looking at companies' innovative strength from a broader system of innovation, whereby the links between universities, businesses and policymakers are crucial.

... combined

By laying both these dimensions on top of each other as a two-dimensional framework, it is possible to map out how specific policy domains impact on the current metamorphosis by innovative companies that are increasingly adopting an open innovation strategy. Take, for example, the combination of the growing number of small companies in important innovations and the policy of stimulating start-ups and small companies. If there is fierce competition in an industry sector, companies will be motivated to capitalise to the maximum on their innovations and intellectual property. The most innovative markets are those where SMEs and start-ups will be able to play a full role. Small companies are also pressing large companies harder to innovate by demonstrating the commercial viability of new applications using new business models. In addition, successes achieved by starters or new entrants keep the market leaders on their toes.

This simple example shows that policy regarding start-up companies must not be approached exclusively from the viewpoint of creating new economic growth, but also needs to take on board innovation policy, which is inextricably linked to competition policy. It also indicates which challenges arise for a government policy aimed at stimulating open innovation. Open innovation requires a forcefully applied lateral policy covering all the relevant policy domains. Innovation is too important to confine it to a specific (and largely separately managed) segment of government policy. It needs to be tied in with labour market policy, competition policy, education, the stimulation of entrepreneurship, and so on. In fact, innovation policy can only generate economic clout if the objectives of other policy domains are also geared towards it. In other words, open innovation necessitates a broader, more integrated view. The question is whether we can attain this objective with policy structures organised on the basis of functional policy domains. In this sense, open innovation constitutes a possible point of departure for rethinking the innovation policy of tomorrow.

Fortunately, a fair number of directly applicable policy proposals can be distilled out of the framework. For example, federal fiscal measures for making it less expensive for Belgian companies to in-license valuable technologies developed elsewhere –potentially abroad – are entirely in line with the philosophy of open innovation.

For more information on open innovation, see **www.openinnovation.eu**

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78 See EWI Review (2) 1: 24.
79 See EWI Review (2) 1: 23 – 25.

Open innovation and globalisation

Recent studies claim that industry is entering a new era of open innovation, characterised by purposeful corporate strategies through which investments in intramural R&D are being supplemented or even substituted by external knowledge sourcing and external paths to commercialisation.

The OPENing project, financed as part of VISION ERA-net, set out to develop an analytic framework for studying the phenomenon of open innovation and globalisation[80] and to examine the role of open innovation strategies in small, open economies. The project[81] was implemented by four teams: NIFU STEP Studies in innovation, research and education (Norway), the Danish Centre for Studies in Research and Research Policy (CFA, Denmark), Management Centre Innsbruck (MCI, Austria) and the Faculty of Economics and Business Administration at the University of Ghent (Belgium).

Open innovation analysed

Chesbrough (2003)[82] defines open innovation as *"the paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to markets, as the firms look to advance their technology"*. Open innovation comprises a wide range of activities, such as seeking opportunities, licensing[83] technologies, and various forms of cooperation. In our analysis we devote particular attention to the outside-in process of open innovation, i.e. the quest for acquisition and integration of the external knowledge of customers, suppliers, knowledge centres, competitors, and so on.

Laursen and Salter (2006) introduce the notions of breadth and depth for their analysis of the search strategies of companies. Breadth refers to the variety of partners or activities and depth captures the intensity of the activity. We extend the concept from search activities to collaboration, protection and external innovation.

Overall, we capture open innovation practices in seven dimensions: the outsourcing of R&D activities; search strategies for innovation; the protection of innovation and cooperation for innovation. These breadth- and depth-related dimensions produce two general open innovation indicators. Finally, open innovation breadth and open innovation depth are collapsed into an overall indicator approximating all open innovation practices of the company. The analysis is conducted using Community Innovation Survey[84] (CIS) data for Austria, Belgium, Denmark and Norway. Table 4 below gives an overview of the open innovation indicators per country.

The results indicate that businesses do implement practices associated with open innovation. These practices have a strong impact both on the capacity for novel innovation and on actual innovation performance. In general it is the breadth of these practices, i.e. the range of interfaces with the external environment, which generates the positive effects. A second important finding is that international and vertical (value chain) collaboration matters. Thirdly, the importance of intramural R&D is underlined. On the one hand, companies need to be open and collaborate, but on the other they need to have sufficient absorptive capacity to recognise opportunities for interaction and absorb such external knowledge.

Shoring up one's knowledge base via international cooperation

This project is based on data collected in Austria, Belgium, Denmark and Norway. The policymakers in these countries

recognise that their small economies need to engage in internationalisation and collaboration. Accordingly, a recent debate in policymaking concerned the national and international character of the subsidy system. In the past, policymakers in these countries have formulated the support measures for companies and/or universities with the demand that the main return should be achieved at the national or regional level. However, for companies operating in a small country it is often difficult to realise most of the return of a project within the respective national borders. Consequently, there is a need to adapt the demand for local valorisation to allow for broad international collaboration.

With the Barcelona and Lisbon objectives[16]. in mind, policymakers have been greatly occupied with the question of how to make industry invest more in R&D. However, surprisingly little research has been done on how to spur businesses to carry out more R&D and consequently accumulate knowledge. In addition, little attention is being paid to the importance of intramural R&D for the absorptive capacity and gravitational pull in international knowledge networks. So far, internationalisation has not been thought of as a channel for triggering reverse technology transfers, and hence domestic knowledge accumulation. (= the outside-in process). Hence the need to adjust policy measures to take the importance of absorptive capacity to strengthen the knowledge base into account.

Belgian entrepreneurs could take up more opportunities

As Table 4 shows, Belgium scores pretty well in the mix and appreciation of external sources of information regarding innovation (breadth and depth of search strategies). Belgian companies are actively seeking fresh opportunities and openings. To a slightly lesser extent they are also making efficient use of these opportunities. However, they tend to score low with respect to the breadth and depth of external R&D activities. Policymakers should try to facilitate access to external R&D. The establishment of centres of excellence[85] for specific sectors is a step in the right direction. There is also a policy role set aside for stimulating entry into collaboration agreements. A framework for this has already been created in the form of the Flemish Cooperative Innovation Networks (VIS, via the Institute for the Promotion of Innovation by Science and Technology in Flanders (IWT)[86]). It is important to follow up the results at a company level if this framework is to be expanded or adjusted. As for protection, Belgium scores rather poorly compared with other countries, indicating that Belgian companies are still paying too little attention to protect their intellectual property (IP)[87]. Maybe this is because they are counting above all on fast-mover advantages[88], but those are merely short-term solutions for growth and should definitely be complemented by an appropriate IP policy. Policymakers can play their part here, not just at the regional and national levels, but also (indeed primarily) at European level.

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References:

- Chesbrough H., (2003), Open Innovation. Harvard University Press: Cambridge, MA.
- Laursen K. & Salter A., (2006), Open for innovation: The role or openness in explaining innovation performance among UK manufacturing firms, Strategic Management Journal 27, 131-150.

80 See p. 46. and EWI Review (2) 1: 23 – 25.

81 The full report (in English) can be consulted at www.visioneranet.org or www.ewi-vlaanderen.be.

82 See EWI Review (2) 1: 24.

83 Organisations agree that their intellectual property (mostly against payment) (= by awarding a licence) may be used by third parties for products or services (= taking out a licence).

84 The CIS survey is a questionnaire on technological innovation (product- and process-related innovation) – See http://www.iwt.be/downloads/publicaties/observatorium/obs45.pdf for an analysis of the CIS-3 survey in Flanders.

85 A centre of excellence entails cooperation between various organisations to link economic policy with policy on technological innovation. - See http://www.iwt.be/opdrachten_vr/innovatiest_vr/exellentie/index.html.

86 See http://www.iwt.be/steun/steunpro/vis/index.html.

87 Intellectual property rights are usually protected by patents. For small companies, the costs of applying for and maintaining patents constitute a major expense, partly because there is still no such thing as a European patent. Moreover, in the event of a dispute the court costs can prove (too) high for small companies. As a result, SMEs are less inclined to apply for patents.

88 Companies profit whenever they are quicker than their rivals at bringing out a new product or service. So when their competitors start offering something similar, the fast movers are already a step ahead, working on their next innovation. In such a rapidly evolving market, protecting intellectual property seems superfluous for generating income.

Table 4: Open innovation indicators – score per country (0 – 10)

Open innovation indicators	AT	BE	DK	NO
External innovation breadth	3.8	3.5	3.7	2.0
External innovation depth	3.4	3.2	3.3	3.5
Search breadth	6.3	7.4	6.9	7.0
Search depth	1.2	1.6	1.3	1.3
Protection breadth	4.1	1.2	2.2	1.7
Collaboration breadth	1.4	2.4	2.9	2.4
Collaboration depth	1.0	1.8	2.4	1.8
Open innovation breadth	3.9	3.6	3.9	3.3
Open innovation depth	1.8	2.2	2.3	2.2
Open innovation, total	2.9	2.9	3.1	2.7

Paranoia

Often scientists plead not guilty, maintaining that there is nothing wrong with the knowledge itself, but rather something amiss with how it is applied. Take the discovery of nuclear fission, for example. The knowledge arising can be used for something positive (generating electricity) or for something negative (developing nuclear weapons). Einstein was not responsible for the development of the atom bomb, but a great many people think he was. All he did was come up with the cryptic formula $e = mc^2$. Research usually shrinks back from society's ability to assess and heed things. It is applications that people notice and which do or do not trigger allergic reactions. So why do these reactions come about?

One factor is fear of the unknown or of something beyond our mental grasp. This factor is as ancient as mankind. In fact, science stems from our fear of nature and our drive to control the world by understanding it. Yet the paradox here is that science itself has started awakening people's fears. After all, much science can only be assessed with difficulty by non-scientists, because scientific principles or methods are abstract, complex and require extensive prior knowledge. For instance, nuclear power is generated in enormous, silent power stations surrounded by gigantic cooling towers that puff white clouds of steam into the atmosphere. But who can say exactly what goes on in them? Radioactivity is invisible.

Fears may be both real and imaginary. Past experience, like the catastrophes in Harrisburg or Chernobyl, has shown that nuclear energy is not entirely safe. Exposure to a high dose of radioactivity can be fatal or cause cancer, as became apparent after the bombings of Hiroshima and Nagasaki or in the wake of nuclear tests in the Pacific. The imaginary aspect of people's fears has to do with, say, their assessment of the risk of such a catastrophe occurring and its scale. For scientists this is a matter of calculating the associated probability, and everyone is reassured when they see the results, whereas laymen let their imagination run wild and dramatise the risks. But of course human factors, like the deliberate use of a nuclear weapon, inattentiveness, disorganisation and defective maintenance remain difficult to factor in.

In addition to being fuelled by fears, our imagination is also tainted by idealism. Now that so little nature is left, it is incredibly dear to us. We all want to go back to nature and adore pure nature. Genetic manipulation is deemed wicked, yet we forget that almost everything we eat or drink is the result of genetic manipulation. For instance, a man's best friend – his dog – is nothing more than a manipulated wolf. Yet dogs 'strokability factor' makes them very popular with many people. Crop cultivation is even a tradition to which mankind owes its survival and continued existence. Originally ears of corn were just 5 cm long, hard as stone and inedible: the product we know today is the result of many years of targeted cultivation. And yet, nobody allows ethical or genetic considerations to bother them when they munch away at their popcorn.

Perhaps fear and idealism coincide to make up our universal aversion to cloning technology. Apparently here we come up against an ethical barrier that science is threatening to overcome. Cloned sheep already provoked an outcry, but what people find most horrifying of all is the prospect of cloned human beings. There are historical, religious and psychological reasons for this. The Nazis' eugenics programme is one example in mind, aimed as it was at 'breeding' ideal Germans by bringing together couples who supposedly fulfilled the Aryan ideal. Another example is the idea that God is responsible for creation and that mankind should respect life without meddling with it. In that respect, for some Christian believers cloning is to be just as forcefully resisted as abortion and euthanasia. However, probably the most important reason is that we see ourselves as unique and irreplaceable individuals.
So there is tension between science and society, a clash between what we know and are capable of and what society finds acceptable. This tension is more acute than ever as a result of the exponential growth of knowledge. In the late 1950s people had more faith in science and technology. Life had become more pleasant thanks to astonishing new inventions like cars, radio and television, which we take for granted today. Yet we don't yet know what the negative consequences of all these fine additions will be. As science develops ever more rapidly, the discrepancy between what science can achieve and what society can accept will grow progressively larger.

The question of whether we should or should not make use of certain knowledge is more a matter of social than scientific choice. But can we leave that choice up to politicians? After all, many of them are sensitive to public opinion.

This could prompt the intention of closing down nuclear power stations without first asking whether there are any alternatives and whether as a result our knowledge in the nuclear sector will not be consigned to the scrap heap. Does the sun shine enough here in Belgium for us to present solar panels as an alternative? Windmills take up lots of space and only generate power if the wind is blowing. A 24-hour economy cannot work on that basis. Now that global warming has become the top ecological problem, nuclear energy seems even rather environmentally friendly, since it is 100% free of CO_2. What about biofuels? Now that more and more farms are switching to biocrops, they are being held responsible for the world's growing hunger and for pushing up food prices. We really need to get our heads round the fact that we can't reconcile all conflicting desires, e.g. for prosperity, permanent availability and environmental friendliness.

Some people go so far as to say that they would like to even ban some kinds of research in advance, because they oppose potential future applications of the knowledge it would gain. Anyone who does that should bear in mind that the development of knowledge has never been successfully prevented and that what we choose not to investigate will enthusiastically and successfully be pursued elsewhere. What if opposition to genetic manipulation had brought the Human Genome Project to a halt? Our knowledge would not have progressed and neither would our knowledge of its applications. Human curiosity and rational human nature are subordinate to people's runaway fears and imaginations, which as we all know make poor teachers.

Resistance to anything new often reminds us of what happened in England after the invention of the steam locomotive: a man walked in front of the locomotive waving a flag to make sure that the locomotive did not travel faster than 5 km per hour. Naturally, that merely heightened people's fears of speed. Nowadays we see greater benefits in a dialogue between science and society. Scientists are encouraged to write articles that popularise what they do, and governments are taking numerous initiatives in a bid to convey science to the masses. The alienation of science from society is being combated by efforts to involve the public in a social debate on scientific issues. Yet it seems highly unlikely that this will end the paranoia that stems from people's fears and imaginative powers. After all, this has been our natural 'mental biotope' for thousands of years.

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Research Division
(with thanks to Bart Dumolyn for all the fruitful discussions)

"The stone age did not end because the World ran out of stones."

Ahmed Zaki Yamani

"Sustainable development will make the difference between traditional companies and true winners."

Thomas Leysen

"The Third Industrial Revolution will take the world into a sustainable future."

Jeremy Rifkin

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