

# **eco@work**

*Sustainable reading from the Öko-Institut*



## **New technologies**

rasping opportunities,  
minimizing risks

To be tested  
**Nanotechnologies**  
in food

To be improved  
**Life-cycle analysis**  
of electricity

To be welcomed  
**Quality guidelines**  
for fruit and vegetables

# Today's HTTs,

## From tiny environmental projects grow mighty technical successes

September 2004 saw the "acorns" initially unveiled to experts at the "Electronics Goes Green" conference: prototype environmentally sound printed circuit boards (PCBs) based on highly temperature-resistant thermoplastics (HTTs). Now, three years on, it seems nothing stands in the way of this environmentally-friendly technical innovation entering the market. This success story grew from an unusual mix of know-how engineered by the Öko-Institut. A university with a reputation for excellence in applied polymer research, a specialist in foaming agents and a manufacturer of machines for plastics processing cooperated with innovative producers and users of circuit boards and recycling specialists.

The result was an environmentally friendly circuit board. It contrasts with conventional products as it eschews toxic flame retardants and is readily recycled, yet it is only slightly more expensive than the standard thermosetting base material. This is a technically accomplished circuit board which is very light, resistant to high temperatures and can be worked both thermally and mechanically. Moreover, this new type of board is excellent for special applications, since HTT boards also possess outstanding high frequency qualities due to their structure and the raw material employed. And the new board costs 30 to 40 euros per square metre to manufacture, about a tenth of the cost of the 'PTFE' or 'Teflon' circuit boards currently used for such applications.

"Our actual aim was to be able to replace the leading standard thermosetting base material. We wanted greater environmental benefit with the same functionality", explains Carl-Otto Gensch, the Öko-Institut's project coordinator. "So when we exceeded our aim of making the new boards technically superior to the standard boards in some areas, and found we would be able to make inroads into the PTFE market, it was a very pleasant surprise! We didn't really expect to achieve that."

"We did explore various avenues for development right from the outset, looking from both environmental and economic viewpoints, and we followed up those options that both viewpoints indicated would be productive", says Martin Möller of the Öko-Institut, who was responsible for the environmental and economic assessment of the new boards. He believes that "This quality product is our reward for supporting development through independent research".

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# tomorrow's PCBs

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Dear reader,

The advent of the nuclear age served to sharpen our awareness of the fact that the development of new technologies can have extremely far-reaching and often undesirable consequences. And yet great hopes are often attached to these technologies, ranging from resource and climate protection through to overcoming vital problems such as hunger and disease. How can the potential of new technologies be exploited without their risks being neglected? And what governance mechanisms are required to support technological innovation where this is necessary for ecological and social reasons? We present a few answers to these questions in our "Big Ideas" under the rubrics of Knowledge, Values, Wishes. Take a look too at the "Small Miracle".

Even if autumn has arrived with a vengeance, allow us to cast our minds back briefly to the summer. This was when we had the pleasure of debating with you and about 300 supporters and celebrating the 30th anniversary of our founding. We would like once again at this point to thank everybody for their good wishes and support, which are a great encouragement to us to continue in our commitment to sustainability.

More activities are planned for our anniversary year: On Friday 19 October we invite you to an evening lecture in our ecological office building, the Sonnenschiff (Solar Ship), in Freiburg. Having been awarded the accolade of being one of "365 landmarks in the land of ideas", we look forward to presenting a selection of our creative research work to you.

I hope you enjoy reading this exciting issue.

Your

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30 years of research for the environment: 300 supporters took part in discussions and celebrations at the annual Öko-Institut conference in Freiburg.

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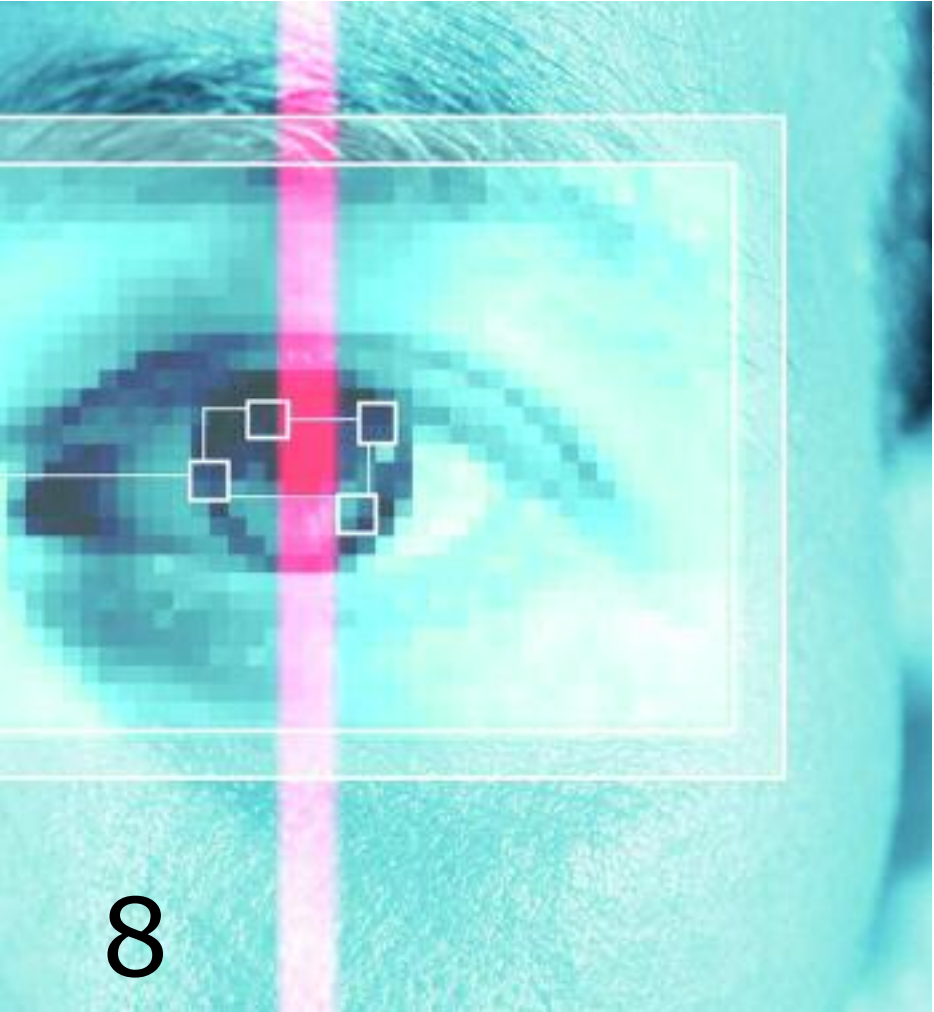
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## Pesticide alert

### Guidelines for fruit and vegetables

Sprayed Spanish paprikas? Strawberry pesticide residues? Foodstuffs contaminated with dangerous amounts of pesticides are making the headlines ever more often. This has prompted the Edeka retail chain to review its quality standards for fruit and vegetables. And this is why the



company is now working together with the Öko-Institut. The experts' task is to review the levels of pesticides found on fruit and vegetables, and, moreover, to take a close look at operational processes. Their findings shall help to identify risks in the inspection systems and to further improve quality management.

The Öko-Institut has a further task: Its scientists are developing ecological, toxicological and social guidelines for pesticide use in fruit and vegetable production. Their stated objective is to enhance the quality of the products in terms of environmental impacts and impacts upon the human organism. This will give Edeka a scientifically underpinned database of critical substances which it can use to impose standards upon producers. Dr. Ulrike Eberle, project head at the Öko-Institut, stresses that "this is an extremely important contribution to precautionary consumer protection."

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## Climate control:

### City of Freiburg unveils new climate action plan



The words "climate protection" are on everyone's lips, but what is happening in reality? The City of Freiburg is setting a good example and has now unveiled a new climate protection action plan, whose key objective is to reduce harmful CO<sub>2</sub> emissions by 40 percent by 2030. The strategy, adopted by the City Council in July, is based on a well-researched report by the Öko-Institut, which was commissioned by the German Federal Environment Agency UBA and prepared in close cooperation with the Energieagentur Regio Freiburg energy agency.

Here's the background: as early as 1996, the City adopted a plan of action which aimed to reduce emissions to 25 percent below the 1992 level by 2010. The purpose of this new report is to review and update the original targets and the City's package of climate protection measures.

So how did the scientists approach their task? In the first part of the report, they outline four different scenarios and

identify the possible implications of each scenario for energy consumption, transport and emissions. Taken together, the scenarios map out the full spectrum of potential reductions of harmful greenhouse gases that the City can achieve. In the second part of the report, the experts then propose specific policy measures geared towards climate protection.

Based on the report, the City has now unveiled a 12-point plan for the next two years. For example, the City plans to move towards the passive house standard for new builds or extensions of existing buildings. More on-site, small-scale cogeneration units will be installed in public buildings and schools in future. There are plans to further increase the share of cycles used in and around the city, which is already at a high level in Freiburg. Other measures include converting the City's car pool to natural gas vehicles, launching a funding programme for thermal insulation in its building stock, and awareness-raising through public lectures.

But climate protection comes at a cost, so the City has voted to invest ? 1.2 million annually in its climate protection projects from 2008. A further ? 2 million will be spent on upgrading the energy efficiency of municipal buildings.

Christof Timpe, an energy expert at the Öko-Institut and one of the authors of Freiburg's climate action plan, welcomes the City's decisions: "Freiburg is taking climate protection seriously and is determined to maintain its role as a lead municipality in this field. However, it is important to involve not only the City's buildings but also households, commerce and industry in the strategy in the coming years."

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## Climate Change as a Security Risk

### New WBGU flagship report presented

In many countries of Latin America, Africa and Asia, poverty, state fragility and social inequity have long been structural problems. People there will now have to cope in addition with the impacts of climate change. What is more, these impacts will be particularly severe in precisely those countries where development is least advanced. Poverty will rise because water and food will become scarce, storm and flood disasters will generate additional instability and the number of environmental refugees will mount. Dissatisfaction will become rampant in large parts of the population and rebel movements will mushroom.



This is the scene painted by the German Advisory Council on Global Change (WBGU) in its new study. The flagship report titled "Climate Change as a Security Risk" warns that without resolute action by the international community the world will be facing major risks. The authors concentrate especially on the dangers presented to international stability. Dr. Rainer Griesshammer, deputy director of the Öko-Institut, is a member of WBGU and one of the study's authors.

WBGU's scientists predict that without firm action to counter climate change the adaptive capacity of many societies will be overstretched. "This will result in violence and destabilization, and will thus jeopardize global security" notes Griesshammer. These processes will be driven by distributional conflicts over land and water resources, an increase in severe storm and flood disasters, and massive refugee flows.

To halt these developments, the experts call for resolute action in international climate policy within the next ten to 15 years. They stress that global greenhouse gas emissions will have to be halved by the middle of the 21st century. The scientists recommend specific ways in which various organizations and institutions can cooperate to achieve this goal. The European Union, for instance, could have the role of climate policy pioneer, driving climate policy forwards in an international setting marked by shifting power constellations.

WBGU spotlights the United Nations as a further important organization. The task of the UN Security Council is to maintain world peace and international security. As these goals will be called into question by climate change, the Security Council's remit should be broadened to include infringements of international environmental law. The scientists further fear that environmentally induced migration will play a growing role in future. The experts concur that this will present a need to regulate the status of environmental migrants in international law.

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## Campaign continues!

### EcoTopTen presses ahead

Good news for all consumers keen to lighten their ecological footprint: The Öko-Institut's EcoTopTen campaign will continue! The German Environment Foundation has now pledged 400,000 Euro in order that the Institute's scientists can continue their successful consumer information campaign. The Öko-Institut experts will publish a total of 20 market surveys at regular intervals throughout the period until September 2010. The EcoTopTen campaign has been under way since March 2005, producing surveys of products which combine good quality with good value for money and low environmental impact. These have ranged from washing machines and dishwashers over cars to TV sets or green electricity. Current surveys of dishwashers and of refrigerators and freezers will already be produced in the course of October. Electricity providers and washing machines will follow in early 2008.

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## Green transportation?

### Strategies for logistics

Whether delivering birthday presents or transporting important documents to a client, courier, express and parcel services are increasingly in demand. However, the economic upswing also has its negative impacts insofar as growth in the logistics industry is accompanied by increasing greenhouse gas emissions. A current project being undertaken by the Öko-Institut is looking into ways of reducing the emissions associated with logistics companies. In cooperation with the chair for logistics at the University of Dortmund and Deutsche Post World Net (DPWN), scientists are developing a strategy tailored initially to specific operations at DPWN subsidiary DHL Express. Building on this, cost-effective strategies will then be developed for DPWN as a whole and for courier, express and parcel service providers in general. For the first time, experts will be taking account of both stationary and mobile logistics processes.

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# New





# technologies

## Grasping opportunities, minimizing risks



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Lessons from the past tell us that future technologies are by no means the unadulterated blessing they once promised to be. However, just because they are not sustainable per se does not mean that it makes sense to demonize them per se either. What strategies are needed to make the most of the opportunities presented by new technologies without losing sight of the risks they entail?

**Looking back over** the last few decades, we might actually have known better. Whether we care to think of genetic engineering, mobile phone technology or the all-pervasive computer technology – the advent of the nuclear age was the point at which we all became unmistakably aware that the development of new technologies can have extremely far-reaching and often undesired consequences. Nonetheless, years went by before academics and politicians began to analyse this knowledge systematically and to take appropriate action.

Today, our millennium is characterized by a newly awakened optimism in the field of research. Innovation and technology are highly regarded, they are actively supported by politicians in the form of numerous research programmes, lent even greater



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**Uncertainty: What opportunities do new technologies present to tackle vital concerns?**

**Evaluative research must become standard**

weight in view of the current debate on sustainability. The hopes pinned on them range from climate and resource protection through to overcoming problems of survival such as hunger and disease. But the contribution that can be made by new technologies to solving society's problems is disputed. This is why, in 2001, the German Research Ministry presented a policy strategy entitled "Innovation and Technology Analysis", aimed at promoting "technology that is in keeping with human and social needs and is environmentally sound". Here, techno-scientific developments are examined from a societal point of view in order to identify "potential risks, gaps in certainty (...) and concerns associated with new technologies" and to provide "recommendations for dealing with them".

In practice, however, the establishment of an independent strand of evaluative research based on dialogue that has sustainability as its top priority has not yet become standard, either in political or business circles. In the view of the Öko-Institut, however, this is

an urgent necessity. "Sadly, people continue to underestimate the significance of evaluative research for an appropriate approach to new technologies on the part of society", comments Carl-Otto Gensch, coordinator of the Sustainable Products & Material Flows Division at the institute. "Not only would it set clearer limits, it also has the potential to further positive developments and to prevent us going down dead ends."

"Even more so the sooner this happens in the development process. This is how new technological developments become more robust", adds Martin Möller, expert for product-related technology assessment at the Öko-Institut. "If a technology is already quite far on in its development, though, the opportunities for intervention become fewer and fewer. In the worst case scenario, both the possibilities and the dangers may get overlooked. Or else they are identified but cannot be realized, or overcome, because there are no concrete strategies for action."

A broad spectrum of methods is available to scientists and academics nowadays for assessing new technologies – depending on the basis, quality and availability of the data. These range from hard science through to round tables and are by no means limited anymore to the core of the tech-



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no-scientific concept of risk with its parameters of probability and level of harm. Soft and participatory methods have also become established over the years. Technology assessment integrates research results on the public perception of technology, communication and issues regarding social acceptance; ideally it takes account of a variety of perspectives. Nevertheless we will always have to deal with two fundamental problems: first, the residual uncertainties in our knowledge base and, second, the methodological impossibility of assessing technology in absolute terms.

On the first point, Martin Möller says: "For me, transparency is a crucial precondition for dealing appropriately with these uncertainties." What assumptions have been made beforehand? What methods have been used and what applications considered? And what are the areas where uncertainty exists? "These need to be depicted in a highly accurate way", he demands. "Wherever we know too little, we need to think even harder about alternatives and do more research, and as long as we are unable to close the knowledge gaps we must apply the precautionary principle."

Carl-Otto Gensch stresses: "It will be possible to attain certainty about the direction we are going in with any given technology only when we examine concrete applications and when the added utility of these new applications can

be scrutinized verifiably with regard to issues of sustainability." This is why it is necessary to examine current and prospective technological applications systematically in terms of the constraints within which they might contribute, say, to reducing greenhouse gas emissions, to preserving species variety or to fostering gender equity, and the extent to which they might do so.

An interdisciplinary and transdisciplinary approach is essential for this purpose – just as the Risk Commission (set up under the auspices of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety) has been calling for since 2003 and just as the Öko-Institut has been practising for 30 years; however, it has not yet been accepted methodologically in every quarter. "Just like the life cycle approach", notes Martin Möller critically. "It's not enough to assess technological applications solely in their use phase. The chains of events that occur before and after use need to be examined just as closely. What happens, for example, when the new nano spray is flushed away and thus enters the sewage system?"

**Life cycle approach is essential**

According to experts at the Öko-Institut, however, political governance mechanisms are also needed when the development of technical innovations is to be supported in areas where this is

prompted by ecological and social reasons. "To be specific, we propose linking research support more closely to achieving sustainability objectives that have either already been set or have yet to be set", says Carl-Otto Gensch. This requires mandatory evaluative research and a sustainability assessment of research programmes.

**Political governance**

For example, milestones should be set for individual research and development projects which encompass more than just technological goals. "The regulator could say, for example, that new technical applications should lead to a 20 percent saving in energy in comparison with the status quo", explains Carl-Otto Gensch. "And in the context of developing the technology, it is important to make clear how this potential can actually be realized and what adjustments are necessary to do so", adds Martin Möller. This would enable a kind of sustainability success check to be implemented in research programmes. Independent evaluative research represents an important precondition for getting things pointing in the right direction early on.

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# Technology applications on the test bench

Example from practice: Nanotechnologies in the food industry



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## What are nanomaterials?

Nanomaterials are structures such as particles, layers or tubes which measure less than 100 nanometres – 1000 times smaller than the diameter of a human hair. Such materials are highly diverse in their chemical and physical composition. The novel properties of artificially engineered nanoparticles or nanosystem components offer interesting possibilities for the development of products and applications, and could potentially make positive contributions to health and environmental protection. On the other hand, nanoparticles may harbour environmental and health risks. To date, the impact of nanoparticles within organisms and in the environment remains largely unknown and unexplored.

**From scratch-resistant car paints** to antibacterial clothing or transparent sun creams – today major sectors of industry are already investigating or actually utilizing nanomaterials. With vast market potential for the future, nanotechnologies are seen as key technologies of the 21<sup>st</sup> century. But little is known as yet about the possible risks that nanomaterials might engender for humans and the environment, and only now is detailed research being initiated. Meanwhile in the food industry the first nanotechnology products are already on the market. Transparent, UV-blocking packaging materials based on nanotechnology are now in use; nanoscale silicon particles are being added to cooking salt as an anti-caking agent. Yet in the food sector, risk assessment is

rudimentary at best, given the lack of basic reference data and the industry's reluctance to disclose information.

The Swiss Centre for Technology Assessment (TA-SWISS) has therefore commissioned a new study from the Öko-Institut – Institute for Applied Ecology. The

## Expectations and risks

aim of this study is to assess the future prospects for nanotechnology use in the food sector and in food packaging, taking an interdisciplinary approach and highlighting the relevant opportunities and risks.

One potential benefit being discussed, for example, is how nanotechnological applications may increase the bioavailability of im-

**Comparing carrier systems**

Under commission from Ciba Specialty Chemicals and Novartis International AG, the Öko-Institut is presently undertaking a risk-benefit analysis of degradable and non-degradable nanocarrier systems in comparison with conventional microcarrier systems. The use of nanocarrier systems is currently being debated in the fields of medicine and cosmetics.



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portant ingredients. Further hopes are vested in the possibility of using nanotechnology to optimize production processes, or incorporating it into food packaging to improve the shelf-life of foods. Potential risks include the unintended mobilization of pollutants by nanoparticles and subsequent leaching into groundwater resources, or the negative interaction of nanomaterials themselves with bio-engineering systems such as water treatment plants. Another unknown or inadequately researched factor is whether certain nanomaterials are harmful to health, and in what ways.

"Based on analysis of the relevant market-related, legal and social aspects, under the TA-SWISS project we will carry out an integrated overall evaluation and make comparisons with possible alternatives. Our study will also take into account the context of changing eating habits and the question of what needs consumers actually have," explains project leader Martin Möller of the Öko-Institut. "Based on the overall evaluation we will be deriving recommendations on whether and by what means it might be possible to achieve sustainable management of nanotechnologies in the food industry." "To that end, we will also be looking very carefully for any gaps in regulation or ineffective steering instruments which might expose consumers to hazards or unleash environmental degradation," adds environmental law expert Andreas Hermann of the Öko-Institut. "It is absolutely imperative to lay down binding guard rails for the ongoing investigation, production and use of nanomaterials – in all sectors, not just the food industry."

**Addressing regulatory shortcomings**

This also means specifying and adapting the details of the regulatory framework where necessary. "But to do that, it is essential to



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have information about the risk potential of nanomaterials" points out Andreas Hermann, referring to a pressing problem that is by no means confined to the use of nanotechnologies in the food industry. "It is therefore vital to develop internationally recognized definitions of nanomaterials quickly, along with appropriate testing and measurement methods." Also, he demands, "Flanking monitoring programmes must be established so that possible risks can be assessed at an early stage." In a legal report commissioned by the German Federal Environment Agency and published in December last year, the Öko-Institut had already pointed out that the first step should be amendment of the EU Chemicals Regulation (REACH) to include nanomaterials.

Nevertheless, even now companies have a duty to make more information available. "Of course it is in the industry's interests for the products it brings to market to be safe for consumers. That is why – at least in most of the larger companies – risk research is already a firm component of product development," says Martin Möller.

But while some branches of industry, for instance the chemical industry, are keen to avoid the communication blunders of the past, so far the food industry has tended to be reticent about releasing information. "It can be assumed that equally intensive research is being done by this industry," says Möller. He thinks it a big mistake, however, that such work is largely proceeding without external flanking research or public dialogue.

Surveys of the German population by the Federal Institute for Risk Assessment (BfR) indicate that only around 10 percent of respondents have general fears that nanotechnologies could give rise to risks. However, consumers take a much more critical stance when it comes to using them in foods. "If nanotechnologies should hit the headlines as a result of inadequate risk management, reversing the existing groundswell of positive public opinion, that would constitute a huge business risk," warns Martin Möller, and goes on to explain the value of independent flanking expertise:

**On the value of external expertise**

"Researchers working in isolation may overlook worthwhile alternatives. In that case, as-

essment will generally be limited to considering the single development path proposed or embarked upon and its eventual culmination in a concrete product for a specific application. But maybe the same end result can be achieved by pursuing a different path, relying on different materials or a lower-risk or more environmentally-friendly technology. Often, only external analysis will highlight these kinds of alternatives. Our analysis not only follows an interdisciplinary approach but also incorporates open dialogue with stakeholders and other interest groups. And it calls upon a broad spectrum of experience, which often exceeds the knowledge gained in one specific industry."

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# What we need are sober analyses instead of overblown rhetoric about possibilities

**Every technology has possibilities, including negative ones**

**The world of technology is full of possibilities** – full of sustainable possibilities, for example. Nanotechnology, to name one area, holds out the promise of reducing natural resource appropriation through the development of new materials or processes supported by the technology; it further promises to make processes for the transformation, storage and use of energy more efficient. Then there is also talk of possibilities with regard to human health – stem cell research, for example, is said to have the potential to cure Alzheimer's and Parkinson's disease. Whenever technology is the subject of discussion nowadays, its possibilities form an integral part of the debate – and they always sound so positive.

In a certain respect this is nothing new. Technology – be it at the design stage or in research – always holds the promise of something that is expected to emerge in the future. Thus, technology always has "one foot in the future". But what has become ever more apparent over the last few years is the way the idea of possibilities has become overblown: research programmes, press releases and political speeches veritably burst forth with the wondrous possibilities of innovative technology. It is becoming harder and harder to judge what is "realistic" about these possibilities and what is mere promise – or even simply an opportunity to further certain narrow interests.

The rhetoric of possibilities has become a force unto itself. It is part of everyday life in research and funding acquisition, and it also serves to influence public opinion. It is often a powerful instrument – after all, who would want to risk neglecting the possibility of curing Alzheimer's for the sake of a few "old-fashioned" ethical concerns? Possibilities of this kind make it difficult to raise objections or even just doubts. Those who do not get caught up in the euphoria of possibilities, but ask critical questions, are soon accused of being an old misery-guts.

However, something that not even the rhetoric of possibilities is ultimately able to conceal is that possibilities are just that – possibilities, and nothing other than possibilities. There is no process whereby technological possibilities for sustainability automatically turn into concrete steps towards sustainable development. Just because something is possible does not necessarily mean it will become a reality.



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Furthermore, technological progress may always contain possibilities, but they are not always for the good. There is also the possibility of misuse, of risks to health, of the ongoing destruction of the environment or even of the human race committing suicide. Barely 30 years have passed since Hans Jonas pointed out exactly these dangers in his work "Prinzip Verantwortung" (The Responsibility Principle). Finally, there is nothing to suggest that the much heralded possibilities of certain lines of technology make them especially worthy of being supported – after all, every technology has possibilities. There is no alternative but to make a comparative assessment.

**Prof. Dr. Armin Grunwald**

became director of the Institute for Technology Assessment and Systems Analysis (ITAS) at the Forschungszentrum Karlsruhe in 1999 and director of the Office of Technology Assessment at the German Parliament (TAB) in 2002. In addition, Prof. Grunwald has held a chair in the Philosophy and Ethics of Technology at Karlsruhe University since 2007.

Given all this, the way the relationship between technology and its possibilities is currently being communicated in the public sphere – in the form of glossy brochures and "innovation offensives" – is by no means necessarily appropriate. Cultural studies scholar Boris Groys put it very succinctly, if somewhat dogmatically, when he wrote: "With any technological innovation, it is never clear whether it will stabilize or destroy existing society".

This is why it is wise to exercise caution when there is too much talk of possibilities. Detailed analysis is what is needed: what are the genuine prospects of these possibilities, can they be realized realistically, what conditions are required to do so, what are the interests behind them, what is the "dark side" of these possibilities? A "deconstruction" of possibilities – a dose of sober analysis – is needed in order to facilitate well-informed and transparent democratic debate in the face of the flood of possibilities.

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## The engineer

Martin Möller would like to see a greater exchange of knowledge

Martin Möller has always been a fan of technology, but in 1986 he experienced his first doubts as to whether new technologies really do always deliver the blessings they promise. He was twelve years old at the time and the whole world was holding its breath after the events at Chernobyl. Today, the 33 year-old environmental engineer is



an expert in product-related technology assessment and has been an integral member of the team at the Öko-Institut since 2002. "The sooner in the development process questions can be raised about where the weaknesses are in the system or how problems can be avoided, the more chances you have to influence the process and to steer it in a sustainable direction", he says – this is the core conviction guiding Möller's work. He sees himself as an all-rounder: "We can achieve the greatest impacts if we actively seek to bring together existing knowledge from different areas." This is why he would be glad to experience in his work a greater willingness to engage in cooperation. "There is still a tendency in Germany to see knowledge more as a possession than to share it with others and ultimately to expand it through communication. The way things are, the amount of knowledge each individual has remains pretty limited." *kk*

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## The chemical engineer

Helmut Elbert seeks to avert crises

In the 31 years of his working life, Helmut Elbert has only once had any doubts. This was in 1986, when he was travelling to Basel early one morning without a care in the world and witnessed workers pulling dead fish out of the red-dened waters of the Rhine. He was shocked – not only about what had happened, but about the response



of those who had caused the disaster. "The message to the outside world was contradictory, and to begin with there was not a word of apology", laments the 54 year-old chemical engineer. Because he wants to do better than this, Ciba's current Global Issues Manager refrains from making any big speeches, and yet there is no doubt that he is a professional communicator. His job is to avert crises. "Open dialogue about risks is a key element for me", says Elbert. "A lot of companies have made significant errors in the past." But the chemicals industry has learned from the Basel disaster – not least, regarding risk analysis in product and technology development: this has long been a part of the business at Ciba. "External expertise is important to us, both so that we can cast a critical eye on our results and to enable us to refer to a credible, independent judgment", emphasizes Elbert. His wish is to tackle the issue in an even more precautionary way. *kk*

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## The sociologist

Dr. René Zimmer places his trust in consumers' sound judgment

In actual fact, he holds a doctorate in behavioural biology. But during the course of his studies, René Zimmer came to the conviction that "human behaviour is much more interesting to me than that of hamsters". This being so, he began in parallel to study the sociology of environment and technol-



ogy. The fascination of looking at technology from a sociological perspective has remained with him ever since. Now, as a member of staff in the Risk Communication division at the Federal Institute for Risk Assessment, René Zimmer is strongly committed to consumer protection. One of his priority issues is nanotechnology. The most important tool at his disposal is dialogue. "Dialogue is increasingly being taken into account in processes of risk assessment, and that's a good thing", says Zimmer. "But as well as having expert and stakeholder dialogues, I would want to see consumers' perceptions of risk being considered much more as well." Zimmer knows from experience that consumers are perfectly capable of making sound judgments. "They just have to be given the opportunity to do so." *kk*

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## Rhetoric and reality

How effective is voluntary Corporate Social Responsibility (CSR)? With the Öko-Institut acting as coordinator of work, researchers explored this issue in a three-year EU project entitled "Rhetoric and Realities – Analysing Corporate Social Responsibility in Europe" (RARE) by looking at four policy fields: climate protection, sustainable fisheries, gender equality and the fight against cor-



**CSR: A piece in the puzzle of sustainability policy**

ruption. The results suggested that while CSR makes a variety of contributions towards achieving greater sustainability, these contributions do not always produce concrete, practical outcomes. On the one hand, CSR helps to ensure that legal requirements are upheld; it reinforces the impact of economic incentives and promotes sustainability over and above the minimum legal standards. "On the other hand, the rhetoric around CSR has grown considerably over the last few years and yet it doesn't always bring about greater sustainability, even in the case of progressive firms", says Regine Barth, coordinator of the Environmental Law & Governance research division at the Öko-Institut. "CSR is most effective when companies establish a strategic link between their core function and products and CSR measures." *kk*

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## Green procurement need not be expensive

From office materials to buses and from food to electricity – the list of items needed by European government bodies is a long one. Purchasing by the public sector accounts for around 16 percent of GDP in Europe; within the EU it represents purchasing power of more than 1,000 billion euros. While the environmental impacts of public procurement are on the

nificant proportion of the overall costs. "Focusing solely on the purchase price can lead to inappropriate investment: the subsequent costs must be taken into account," she says. The subsequent costs of green products are often lower, thus partly or wholly offsetting the possibly higher purchase price.



**The initial price of purchase can be higher for green products, but this is offset partly or even entirely by lower costs of use.**

whole well known, there has in the past been no reliable data on the costs and benefits of environmentally friendly procurement. The issue of cost is, however, a major obstacle for green procurement. On behalf of the EU the Öko-Institut, in cooperation with ICLEI, has calculated the lifecycle costs of around 30 products in eleven product groups, gathering the information for selected EU countries with differing price levels.

The result: the comparison of overall costs shows that green products are not necessarily more expensive than conventional ones. Overall costs include not only the purchase price but also the subsequent expenses – such as energy costs – that arise from use of the product; as Ina Rüdener of the Öko-Institut points out, these often constitute a sig-

For some green products the market is nevertheless still small. "Public demand can help to enlarge it and to drive innovations forward", says Rüdener. "This can also have a positive impact on private consumption." There is also a significant reduction in costs and environmental impacts when items purchased are appropriate to their intended use – that is, cars, computers and other products that are purchased should not be more powerful than is necessary.

Political signals are important here. The EU must redouble its efforts to persuade governments to put green procurement on the agenda. "That includes actively promulgating the results of this study", emphasizes Ina Rüdener. *kk*

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## Climate protection with projects abroad?

Germany has committed to fulfilling its greenhouse gas reduction commitments under the Kyoto Protocol by 2012 solely through domestic measures.

However, many recent studies show that only a few years remain in which to achieve the turnaround. So should Ger-

The option of cost-effective CO<sub>2</sub> reduction can help to ensure that more ambitious climate goals are set while offering the opportunity to involve other countries as well. "If there are climate protection potentials at very low cost in developing and newly industrializing countries, it makes sense to use them", says Lambert Schneider, a re-



### **What hope do flexible instruments such as the Clean Development Mechanism or Joint Implementation hold for climate protection?**

many be participating in climate protection projects abroad? What are the long-term perspectives for flexible mechanisms such as the Clean Development Mechanism (CDM) and Joint Implementation (JI) in Germany?

These issues are explored in a new report by the Öko-Institut and the Centre for European Economic Research in Mannheim. The researchers conclude that because they are often more cost-effective, these instruments will play a significant role in future. They also found that CDM and JI are already being utilized extensively by companies, or firms plan to do so in future, so there is no need for specific promotion of these mechanisms.

searcher at the Öko-Institut. Encouraging the USA to sign up would also be a major step forward.

Despite the major potential available in developing countries and some Eastern European states, the Institute's researchers recommend that Germany should focus mainly on implementing measures domestically: firstly, because the industrialized countries should take a lead role in climate protection and need to cut their emissions by 60-80 percent in the long term, and secondly, because the less developed countries are more likely to meet climate protection targets if the industrialized countries set a good example. *sf*

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## More Transparency

Nuclear, gas, coal, renewables – how is the electricity supplied to customers being generated? Since December 2005, electricity suppliers in Germany have been obliged to disclose the sources of their energy mix and inform consumers about the associated environmental impacts. "The new labelling scheme has greatly enhanced market transparency. Consumers can



### **Today, consumers know more about the power mix of their energy supplier.**

now compare electricity services more easily and make a judgment based on environmental criteria", says energy expert Christof Timpe from the Öko-Institut which was commissioned by the German Federal Environment Agency UBA to study the potentials and requirements of electricity labelling. Labelling may lead to an increase in demand for "green" electricity in the medium term. "But there is still a great deal of scope for improvement", emphasises Timpe. In particular, the information should be presented in a standard format that is easy for consumers to understand. Tracking procedures must also be improved to ensure that the errors which are still occurring – such as double counting of electricity from renewable energy sources (RES-e) in the statistics – are avoided. *kk*

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What would life be like if ...

# ... computers protected the climate?

The ecological footprint of computers & co.

**When Erika M. sits using her notebook PC,** she can consider its electricity consumption with a clear conscience. Her computer uses very little power: it is in Energy Efficiency Class A, the newly introduced top category. When Erika M. bought her computer the shop provided her with detailed information about it. So she knows that her notebook PC was produced under fair social conditions and that wastage of energy and material during production was as far as possible avoided.

Such a scenario has until now been a pipe dream. But that could soon change: the IT industry is slowly beginning to take account of climate protection issues. For example, at the IFA – the international consumer electronics fair held in Berlin – some manufacturers were showcasing their “green” alternatives. The reason for this sudden interest in the environment is clear: the industry wants to be prepared to meet the requirements of the Directive on the Eco-design of Energy-Using Products that are expected to come into effect in 2008. These requirements could include, for example, compulsory minimum standards for household appliances and computers. In addition, the manufacturers are hoping that this is a good business move; the more the media focus on climate change, the greater the potential for using climate protection features as a sales point.

But the manufacturers’ commitment is only a first, tiny step. The Öko-Institut estimates that the annual energy consumption of a



computer used for an average of four hours a day is between 88 and 787 kWh, depending on the specification and efficiency of the machine. For a notebook PC the range is between 22 and 166 kWh. To this must be added the consumption of energy and resources in production, logistics, recycling and disposal. Taking all these factors into account, it is clear that computers are responsible for the emission of countless tonnes of harmful CO<sub>2</sub> into the atmosphere. Moreover, since 2000 the power consumption of the Internet has doubled; in 2005 global use of the Internet consumed the output of twenty 1,000 MW power stations.

And the IT industry is growing. According to a survey carried out by the German IT industry association Bitcom, the mood in the high-tech sector in Germany is more buoyant than it has been for the last six years. The survey shows that 78 percent of companies expect turnover to increase in 2007. The association’s figures

show that more than three-quarters of all German households now own a computer and 56 percent of those in employment in Germany use a computer at work.

The very fact that the IT sector is booming means that it has a clear duty to play its part in climate protection – and to take action more quickly and more rigorously than in the past.

*Christiane Rathmann*



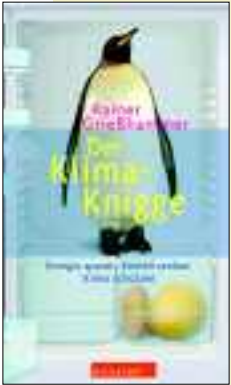
**Christiane Rathmann**  
has been head of the  
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and press spokesperson of the Öko-Institut since 2003. She previously worked for many years as an editor and reporter for daily newspapers and radio. Alongside the telephone, the Internet is one of the journalist’s most important information tools. She uses a notebook PC at work.

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## Reading resource

## Getting out of the fridge



When people hear the words "climate protection", many think of sacrifice: no cars, no ready-to-serve dishes, just the light of pale blue fluorescent lamps. Dr. Rainer Griebhammer does away with such preconceptions in his new book – "Der Klima-Knigge", which translates loosely as "Climate Etiquette". The bestselling author and deputy director of the Öko-Institut shows that people living lightly on the climate do so with no loss of comfort and convenience, enjoy greater health and even spend less.

A penguin in a fridge introduces the theme of climate warming. In its presentation of causes and effects, the

book intertwines scientific material with short stories. The author fills the reader in on the role of greenhouse gases, the different meanings of "weather" and "climate", and the ways climate researchers go about their work. With his visit to the tomb of the unknown polar bear, Griebhammer casts the consequences of climate change in stark relief.

The book (available only in German) will make interesting reading for the uninitiated and the expert alike. It paints a clear picture of the issues surrounding climate change, while taking many surprising turns. In short: a must-buy!

sf

Dr. Rainer Griebhammer: "Der Klima-Knigge", August 2007, publisher: Booklett. Brodersen & Company GmbH, Berlin, 189 pages, 16.90 Euro. ISBN 978-3-940153-02-9

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## Reading resource

A hotspot of diversity:  
The 2008 ecology yearbook

Nanotechnology, species conservation and replenishable cropping resources are just some of the issues explored in the latest edition of the ecology yearbook – Jahrbuch Ökologie. Climate change is a further focus; Martin Cames, energy expert at the Öko-Institut, writes on ways to integrate aviation in emissions trading. Dr. Rainer Griebhammer and Michael Sailer are further Öko-Institut authors. This latest edition of the yearbook with its diverse perspectives and topical themes makes

interesting reading for everyone interested in environment and ecology.

sf

Günter Altner et al. (Ed.): Jahrbuch Ökologie 2008 (2008 ecology yearbook), C.H. Beck Verlag, Munich 2007, 320 pages, 14.95 Euro. ISBN: 978-3-406-54817-8

## Revamped website

To mark its 30th anniversary the Öko-Institut has relaunched its website. Visitors will appreciate the quality of the new design, the user-friendly navigation and the new material that the site contains. The website's fresh green colour, its full-colour photographs and the new layout will tempt readers to discover more about the Institute's work. The site's priorities are service and information, combined with a free download option.

Interested? Find out more at [www.oeko.de](http://www.oeko.de).

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## A date for your diary

## Conference in Berlin

"A Progressive Environmental Code?" is the title of a conference being hosted by the Öko-Institut in collaboration with Deutsche Umwelthilfe (German Environmental Aid) and the Unabhängiges Institut für Umweltfragen (Independent Institute for Environmental Issues) on Monday and Tuesday, 29-30 October 2007. It will take place in the conference centre of the Catholic Academy in Berlin and will focus on Germany's draft bill that is intended to restructure the body of environmental law. The conference aims to consider the draft from technical and legal points of view. For further information and the programme go to: [www.umweltgesetzbuch.org](http://www.umweltgesetzbuch.org).

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## Brochures from the Öko-Institut

The Öko-Institut has now published two new brochures: The "PROSA Guideline" integrates tried and tested methods allowing companies to analyse their product portfolios, products and services in terms of sustainability and corporate strategy. The second brochure, titled "Resource fever", shows ways to use resources responsibly. Both brochures can be ordered free of charge from: [redaktion@oeko.de](mailto:redaktion@oeko.de).



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## Corporate responsibility – how far does it go?

The issue of ecological and social responsibility is a challenge that companies are increasingly having to face. Yet how effective are the principles of Corporate Social Responsibility (CSR) in reality? How do they contribute towards achieving European policy objectives? These and many other questions associated with the topic of “Values for Business” are the focus of the next issue of *eco@work*.

Using the example of a wide-ranging EU project that has been completed, we show where CSR has a real impact and where mere rhetoric is at work. We will also be presenting the tried-and-tested product sustainability assessment method known as PROSA, which enables companies to analyse product portfolios, products and services strategically from the point of view of sustainability. Read all about it in December.

