ISSN 1863-2009
March 2007

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

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Sustainable reading from the Öko-Institut

The new resource debate

Green hope?

Great potential
Recycling cars and electroscrap

Great productivity
Closing the loop

Great commitment
Paul Brunner
A portrait

End-of-life cars -

Why the Volkswagen SiCon process has won two environmental awards

No longer roadworthy, the body is rusting and repair really not worthwhile. Where to put the ancient car? Off to the scrapyard, many might say. But what actually happens to the vehicle then? Which materials can be consigned to further use? Which residues will go to landfill or even to incineration? To address the dilemma, Volkswagen and SiCon GmbH have joined forces to develop an end-of-life vehicle recycling process with minimum environmental and resource impact. Put simply, the new technology converts wastes back into resources.

What exactly happens? In collaboration with SiCon GmbH, a small enterprise in Hilchenbach, Germany, Volkswagen has developed a mechanical processing technique to commercial maturity. The VW-SiCon process extracts recoverable secondary resources from the shredder residues. This is done by means of a multi-stage comminuation, grading and sorting process. Three material groups account for most of the process output: granulate (hard plastics, rubber), fibres (polyurethane, foam, textiles) and sand (glass, rust, iron, paints, dirt, and copper, lead and zinc residues). The secondary resources gained can be reused instead of landing on a landfill or going into a waste incineration plant.

The technology makes it possible not only to recycle end-of-life vehicles cost-effectively, but also electronic and mixed scrap. This makes optimum use of the resources contained in wastes. "In our view, end-of-life cars are no longer a useless, but a valuable resource", announces VW.

Facilities operating with the new process have already been built in Belgium and in Austria. More are planned or under construction in seven European countries.

Last year, the process won the European Commission's European Environmental Award. In the same year, the Federation of German Industries (BDI) honoured the innovation with its own environmental award, too. *cr*

info: www.oeko.de/071/smallmiracles

– A rich resource

Dear reader,

A 2007 Landmark:
The Öko-Institut.

For years now the Öko-Institut has been warning about the accelerating overexploitation of natural resources. At last this has become a hot issue in the media, politics and business, too. "Without a secure supply of raw materials, the wheels of German industry will grind to a halt", proclaims the Federation of German Industries, for example, in a recent publication. Many stakeholders are turning their attention to the issue of scarce resources, not so much for environmental reasons than for economic ones. But in the "new resource debate" lies a great opportunity for the environment. The Öko-Institut has recognized this opportunity and stakes out its position in an article. Read in the "Big Ideas" section what we think needs to be done and why we in Europe still have some homework to do.

Whether resource debate, climate change or the organic farming boom: Scientific expertise on sustainability issues is in greater demand than ever before. The Öko-Institut looks back on 30 years of work towards the goal of an ecological renewal of society. In our anniversary year, our work is being honoured by an award within the Germany-wide "365 Landmarks in the Land of Ideas" award scheme.

To mark this award, the Öko-Institut will present a selection of its research work on Friday, 19 October 2007, to the public in the Freiburg Solar Ship, Merzhauser Strasse 173. The Institute will also use that day to receive the "2007 Landmark" award, a part of the "Germany – Land of Ideas" initiative. This is a scheme sponsored by the German government and German industry, with Deutsche Bank as project partner. A date to note in your diary! We will be announcing the day's full programme of events soon.

A few months earlier, on Friday, 22 June 2007, the Öko-Institut will be holding its annual conference and ceremony to commemorate its 30-year anniversary. We will be welcoming high-level speakers and guests in the Historisches Kaufhaus in Freiburg. Further information and the full programme will soon be available at www.oeko.de.

We wish you a sunny spring and enjoyable Easter!

With warmest wishes

Christiane Rathmann, head of Public Relations & Communication,
c.rathmann@oeko.de, phone +49-761-452 95-22

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Imprint

eco@work – March 2007

Published by:
Öko-Institut e.V.

Edited by:
Christiane Rathmann (cr)
Katja Kukatz (kk)

Responsible editor:
Christian Hochfeld

Further authors:
Dr. Matthias Buchert (mb), Martin Cames (mc), Miriam Dross (md), Dr. Rainer Grießhammer, Andreas Hermann (ah), Christine Strauß (cs)

Design/Layout:
Hannes Osterrieder

Technical implementation:
Markus Werz

Address of editorial office:
P.O. Box 50 02 40, D-79028 Freiburg
Phone: +49 (0) 761/45295-0,
Fax: +49 (0) 761/45295-88
redaktion@oeko.de
www.oeko.de

Printed on 100 percent recycled paper

Coverphoto: © Patrick Hermans - Fotolia.de

SECTIONS

Emissions trading in aviation

The risk of "tankering tourism"

Emissions trading is an environmental policy instrument which is intended to reduce CO_2 emissions and achieve the climate protection targets set out in the Kyoto Protocol. Moves are currently afoot to extend emissions trading to aviation as well. In a new discussion paper, Martin Cames, a climate and energy expert at the Öko-Institut, draws attention to the associated risks.


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If fuel suppliers – rather than the airline companies themselves – are integrated into the emissions trading scheme, falling kerosene prices outside the EU and rising prices for EU emissions certificates could make "tankering strategies" very attractive to air carriers. This means that aircraft could increasingly be refuelled for both legs of the journey beyond EU boundaries, i.e. beyond the scope of the EU's emissions trading scheme, thereby enabling air carriers to evade the scope of emissions trading for some flights, explains Cames.

So how would tankering strategies impact on climate? Due to the greater weight of the fully refuelled aircraft, CO_2 emissions would actually increase, not decrease, since more fuel is consumed for every tonne of fuel that has to be additionally carried. The effect of emissions trading in aviation would therefore be lower than planned. From the Öko-Institut's perspective, there is therefore a very strong argument for integrating the air carriers, not the fuel suppliers, into the EU's emissions trading scheme. *cs/mc*

info: ***m.cames@oeko.de***
www.oeko.de/071/freshaction1


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Public Private Partnership

Prospects for sustainable retrofits

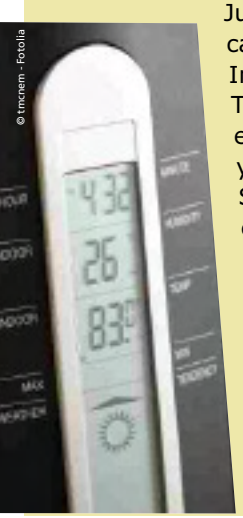
Many municipalities are facing one and the same problem: There is a great need to renovate public buildings, but public coffers are empty. Cooperation between the public and private sectors is an alternative: Public Private Partnership, PPP. Looked at from the point of view of sustainability, how can PPP be assessed and optimized? The Öko-Institut, the Ö-Quadrat consultancy and ICLEI have now joined forces to explore this theme. Taking the retrofitting and operation of schools as an example, they have drawn up ten key principles for improved integration of sustainability aspects within PPP projects.

The scientists recently put these principles up for debate at an expert workshop. It soon became clear: For local authorities unable to conduct sustainable retrofitting of public buildings on their own, PPP holds out great opportunities as long as certain criteria are met. "These include careful contract design which clearly targets sustainable retrofitting" says Dr. Dietlinde Quack of the Öko-Institut. "Incentive systems motivating both parties to act sustainably are important." Some, such as the city of Frankfurt, are also showing that sustainable retrofitting can be done in an exemplary manner even without PPP. *kk*

info: ***d.quack@oeko.de***
www.oeko.de/071/freshaction1

Smart and green:

Smart appliances to boost renewables use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Just imagine: the washing machine automatically downloads the weather forecast from the Internet and tells you that today will be sunny. This afternoon, there will be enough solar energy to run a 60° laundry programme which you can pre-programme in the morning. Sounds like sci-fi? Not to the Öko-Institut's experts – they believe this could soon become reality. Smart Domestic Appliances in Sustainable Energy Systems – or Smart-A for short – is a new project involving the Öko-Institut's researchers and a project consortium from science and industry.

The aim of the two-year research project, which is being funded by the European Union, is to harness the potential for "smart" domestic appliances which automatically coordinate their operation with the fluctuating levels of energy supply from renewable sources and heat and power cogeneration. The project team is exploring which technologies are most appropriate for this type of application and are also undertaking a detailed assessment of consumers' acceptance of these new appliances. With the introduction of smart green appliances, households could play a pro-active role in boosting renewables use in the coming years. *cr*

info: ***c.timpe@oeko.de***
www.oeko.de/071/freshaction1

Rewards for energy savers:

White certificate trading schemes

Climate protection is closely linked with the issue of energy efficiency. But which instruments can offer sound incentives for energy saving? In a new working paper, Veit Bürger and Kirsten Wiegmann, energy experts at the Öko-Institut, look at white certificate schemes and their potential for encouraging energy saving. They describe the basic principles of these schemes and explain how they are already being implemented in some of Germany's European neighbours, notably Italy and Great Britain.
"In white certificate schemes, various stakeholders – such as the local energy suppliers – commit to saving a specific amount of energy within a given period", explains Veit Bürger. The overall reduction target is adopted in advance at political level, with specific targets then being set for participants in the scheme. Companies can fulfil their commitment by insulating their buildings, for example, or paying bonuses for the purchase of highly energy-efficient domestic appliances. They then receive white certificates for the energy savings achieved.

Anyone not wishing to invest in energy-saving measures themselves can meet their commitment by purchasing additional certificates. Participants who exceed their reduction target can carry over their "surplus" certificates to the next commitment period or sell them. As this new steering instrument appears to be well suited to creating fresh impetus in demand-side energy efficiency, the Öko-Institut is proposing the launch of a pilot project as soon as possible as a means of gaining practical experience with such schemes. *cs*

info: ***v.buerger@oeko.de***
www.oeko.de/071/freshaction2

Corporate Social Responsibility

Measuring performance systematically

Many companies are now declaring their adherence to the principles of Corporate Social Responsibility, CSR. Franziska Wolff of the Öko-Institut summarizes the findings of a survey conducted within the context of the EU-funded research project RARE as follows: "A first practical step is often to use a CSR programme to implement statutory requirements better than in the past. More advanced companies also commit voluntarily to more sustainability above and beyond statutory requirements – however, they do this mainly in fields that are also economically profitable for them." The survey questioned 49 companies in the mineral oil industry, the banking sector, the fish processing industry and SMEs in the automotive supply chain on their CSR activities.

"What the survey also shows is that companies are not measuring systematically the actual results of the CSR activities they are introducing" notes her colleague Katharina Schmitt. "This, however, is a key precondition for real improvement if CSR is to be more than a mere PR tool." The companies need to do more here in future. *kk*

info: ***f.wolff@oeko.de***
www.oeko.de/071/freshaction2

Renewable energies

Nurturing acceptance

New energy technologies are key to combating climate change. However, if wind turbines alter landscapes, geothermal trial drilling triggers earthquakes, or the safety of geological CO_2 storage becomes an issue, stakeholder groups voice weighty concerns. Handling these at an early point is the purpose of "Create Acceptance" – a new EU-funded research project involving the Öko-Institut and further partners from nine countries.

"We will get local communities and investors to sit down together to shape new energy technologies in a manner acceptable to society" says Dr Bettina Brohmann, energy expert at the Öko-Institut. "We will launch five pilot projects to trial suitable planning tools. These projects will involve biomass, wind, solar thermal, hydrogen and geological CO_2 storage." An essential element of the project is that all stakeholders will be able to voice their views. The project builds on "Socrobust", a precursor tool already trialled internationally. *kk*

info: ***b.brohmann@oeko.de***
www.oeko.de/071/freshaction2

More less

There is a growing awareness of the value of natural resources, and the burdens incurred by the environment, which are increasing due to over-exploitative mining and processing, are addressed with growing frequency in the media.

In addition to the pre-eminent issue of global warming brought about by greenhouse gas emissions, the theme of natural resources has recently begun to attract a great deal of attention in the media, politics and the world of business.

The increase in raw materials prices is hitting industry hard, not least because for years it has concentrated on lowering labour costs.

innovation – resource extraction

A new debate is underway about natural resources. The Öko-Institut makes its position clear.

Staff members at the Öko-Institut, who have been warning of the many and varied disadvantages and dangers of unrestrained overexploitation of natural resources for years and even decades, are "amazed" at the intensity of the "new" debate about natural resources. For many years it was anything but easy to find allies who were keen to hear about important research results and findings related to resource issues and would disseminate relevant proposals or even put them into practice; however, a shift has now occurred. The very same news magazine that a few years ago made fun of Germany as a "country of rubbish separation and tin can deposits" last year dedicated a series of lead articles to the "battle for raw materials". The Federation of German Industries (BDI) made it clear in a recently published technical brochure on the subject that: "Without a secure supply of raw materials, the wheels of German industry will grind to a halt."

However, the mounting global environmental pressure is only a secondary concern behind the new debate about resources. The main reason why natural resources are at the centre of political and public debate is because the prices of most raw materials have risen enormously over the last few years. This applies not only to energy sources, such as crude oil or natural gas, but also to metals, which have become considerably more expensive due to growing demand worldwide. For example, iron ore pellets have gone up in price by 122 percent (2003 to 2005); copper has more than quadrupled in price since 2003. The increase in raw materials prices is hitting industry hard, not least because for years it has concentrated on lowering labour costs and, against the background of sustained low raw material prices, has lost sight of the web of global dependencies in which it is caught. Television reports about the world's hot spots, for example in regions rich in raw materials, such as the Middle East and Central Africa, have now ignited fears over the possibility of scarcity or even increasing global conflict.

Despite all this, the new debate about resources presents an opportunity for environmental performance and sustainable development. There is a growing


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A simple, straightforward example shows how much potential is still left undeveloped in developed Europe. In the packaging sector throughout the EU-25 countries, the recovery rate for glass in 2004 was only 58.3 percent.

awareness of the value of natural resources, and the burdens incurred by the environment, which are increasing due to over-exploitative mining and processing, are addressed with growing frequency in the media.

Homework to be done at home.

For some years now the Öko-Institut has been producing studies on material flow management (for example, for Study Commissions of the German Bundestag), sustainable production and sustainable consumption that have addressed resource issues,


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Especially in the huge urban centres of Asia, will lead to a total shutdown: the transport routes in the cities will inevitably clog up.

and has been working hard to promote sustainable resource efficiency. The Institute regards the agreements adopted at the Rio Earth Summit in 1992 as a solid foundation for international cooperation – without neglecting the "homework" that is necessary in our own country. Our positions and areas of expertise:

Sustainable resource efficiency and policy

- prevents dependency,
- reduces local and global pressures on the environment,
- fosters distributional equity,
- is a driving force behind strategic innovation and development.

The current debate on scarcity needs to include sustainability as a key to the solution. On this theme, the Institute offers integrated responses in the crucial areas of extraction, processing, utilization and reclamation of resources.

The Institute has solutions that lead towards sustainable resource efficiency, based on

- three decades of experience in research and consultancy,
- interdisciplinary approaches,
- concrete analysis and evaluation tools,
- familiarity with and consideration of the needs and perspectives of those in politics, business and society.

Particularly in view of the current debate – in which the established industrialized nations like to point a finger at the newly industrializing countries, and at China first and foremost – it is important to put our own house in order first.

Natural resources are …

… all components of nature that provide utility to humankind, whether directly through their use or consumption or indirectly as materials that can be used in the production of goods and services. Some examples: non-renewable resources, fossil energy sources, replenishable resources, genetic resources, perpetual resource flows such as solar energy, wind and water, the soil. *mb*

While newly industrializing countries such as China and India play a part in the recent marked rise in resource use, the industrialized countries are still far ahead in terms of per capita consumption of many resources and even in terms of absolute consumption. The established industrialized countries must therefore set a good example by more rapidly making use of their own potential and, additionally, fostering an exchange of experiences and technological cooperation with the newly industrializing and developing countries.

Much potential is left unexploited.

A simple, straightforward example shows how much potential is still left undeveloped in developed Europe. In the packaging sector throughout the EU-25 countries, the recovery rate for glass in 2004 was only 58.3 percent and 58.7 percent for metals. And not only the new EU countries performed poorly in this respect. If the best recycling rates (80 percent and more) achieved by individual countries were emulated throughout the EU, millions of tonnes of raw materials, such as iron ore and bauxite along with


Facts and figures		
Population (millions)	1.308	82
Housing floor space per inhabitant (square metres)	28,69	40,80
Private cars per 1000 inhabitants	14	562
Television sets per 1000 inhabitants	313	437

Source: National Bureau of Statistics of China (2006): China Statistical Yearbook 2006. Beijing. German Federal Statistical Office, German Federal Motor Transport Authority

Raw materials or resources are …

… basic substances involved in the production process that have previously been neither prepared nor processed. Experts distinguish between plant, animal, mineral and chemical resources, depending on their origin. Energy resources are often grouped together separately. A further differentiation consists in renewable resources and non-renewable resources. Finally, there are the terms primary and secondary raw materials or resources. *mb*

A developed industrialized country such as Germany, with its know-how, has a huge potential for reducing its resource use in both the medium and long term. This includes more energy-efficient vehicles and making greater use of renewable resources.

considerable quantities of energy sources, could be saved each year.

A developed industrialized country such as Germany, with its know-how, has a huge potential for reducing its resource use in both the medium and long term. This includes developing and spreading efficient production procedures, building or renovating buildings that make the best use of materials and are energy-efficient, developing and producing lighter, more energy-efficient vehicles, making greater use of renewable resources and further developing the considerable potential of closed-loop materials management.

The inexhaustible resource of human creativity and intelligence is the essential key to solving problems with physical resources. On the one hand, it provides a means to reduce resource use "at home" and in Europe. On the other, it provides an opportunity, through cooperation and the transfer of technical solutions, to convey to emergent economies, such as China, a new perspective on how to deal with their enormous environmental problems in a way that does not play off ecological and socio-economic concerns against one another. Alongside efficient technologies, it is also important to make clear the value of intelligent services and logistics systems in knowledge-based societies. Further unrestrained expansion of motorized personal transport, especially in the huge urban centres of Asia, will lead to a total shutdown: the transport routes in the cities will inevitably clog up. Experiences with public transport systems and their benefits in Europe and Japan, for example, are a key area for lowering the global demand for resources.

Germany needs to drive forward the intelligent handling of resources and to draw much more deeply on its knowledge resources. Strategies need to be designed for the long term and protected from the influence of lobbyists who are generally interested only in short-term particularistic interests. German industrial sectors need to lead the field in sustainable resource efficiency worldwide. There is no alternative perspective, because things can always be produced more cheaply somewhere else in the world, be it at the expense of human rights and natural life-support systems.

Sustainable resource efficiency must ultimately limit the rates of resource extraction, the associated environmental pressures and the impacts arising in all stages of product life cycles (processing, use, re-use, recovery) until global population numbers level out in the long term. The goals of Rio on intra-generational and inter-generational equity must be taken into account in this endeavour, meaning that there should be fair opportunities and living conditions for all people today and for future generations.

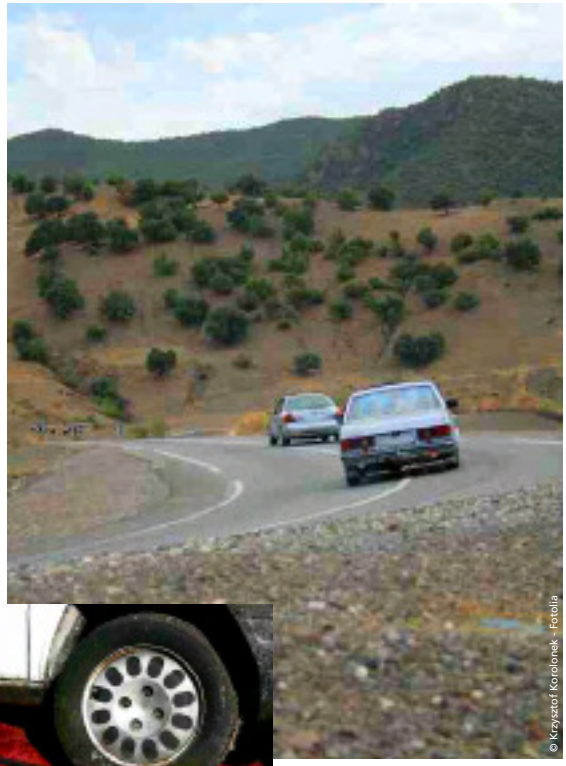
The Öko-Institut will soon be publishing a brochure entitled „Ressourcenfieber" ("Resource fever"). It will provide more details about the issue, present projects and activities of the Institute and offer fresh ideas for research and action. You can find out more when the brochure appears at www.oeko.de.

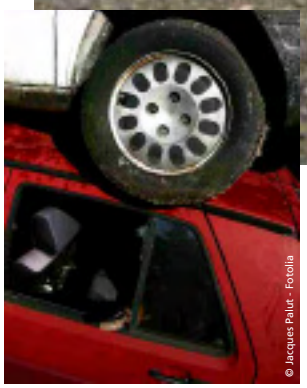
Dr. Matthias Buchert /
Dr. Rainer Griesshammer

info: ***m.buchert@oeko.de***
r.griesshammer@oeko.de
www.oeko.de/071/knowledge1

When your old car is still on the road in Africa ...

... life-cycle management gets challenging: Towards globalized recycling streams for precious metals





Since exported used vehicles may well be on the roads for another few years – perhaps in West Africa – we can therefore assume that the delicate ceramic structures in the catalytic converters are largely destroyed during use, meaning that the platinum group metals are distributed widely and lost to recovery.

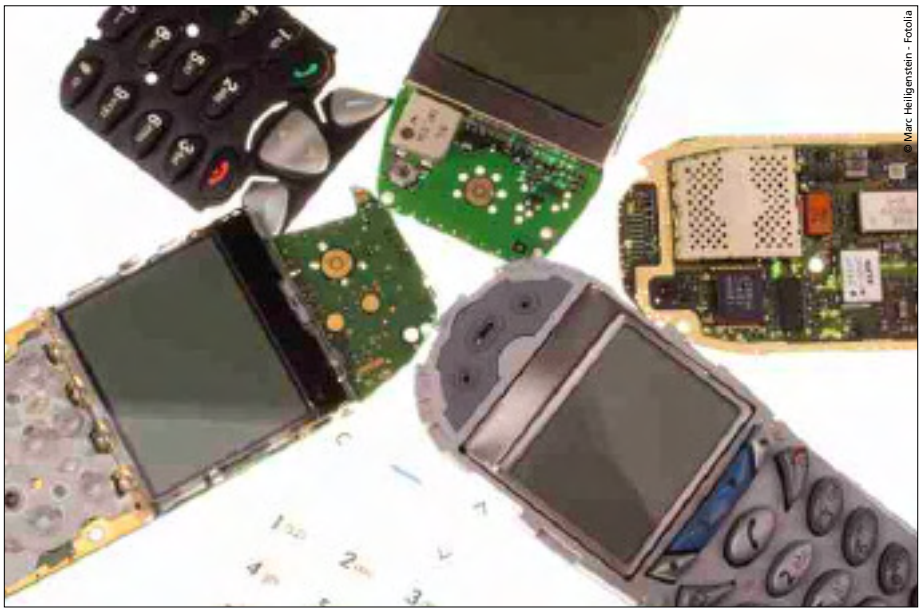
Used cars and electrical equipment can still be used once their first owner has finished with them, and this helps conserve resources. But what volume of pre-owned goods is exported, and to which regions? Who is involved? What happens to the precious metals in the products once their useful lives finally end? Are raw materials being lost to recovery if an old car is still being driven, but elsewhere – in Africa, for example? So far, very little has been uncovered about this systematically. In the Öko-Institut's new research project, its scientists followed up these questions on behalf of the German Federal Environment Agency (UBA), with the support of the company Umicore. The project took Hamburg as an example, researching the export streams of end-of-life cars and electrical equipment leaving the port, mainly for Africa and Asia.

This project was completed in late 2006, and aimed to gather more information on the volumes, regions of destination, institutions and stakeholders involved in such exports. The information is important for anyone hoping to recycle valuable secondary resources such as precious and non-ferrous metals contained in old, used cars, electrical equipment etc., since the practice is dependent on cooperation between industrialized, transition and developing countries. That is why another of the study's aims was to identify, and raise awareness among, potential partners in improved life-cycle management such as shipping companies.

Overall, the trade in, say, used cars to West Africa represents a key economic factor, and is associated with large numbers of jobs in the countries involved (in transportation, sales and repairs). Equally, the principle of the free movement of goods dictates that we should not restrict the meaningful reuse of used goods abroad. Our aim must therefore be to learn more about the destinations of the materials streams involved, and to identify any deficits which exist. This will enable us to identify and ultimately harness any future potential for an optimal international life-cycle management network.

We already know that Germany exports a large percentage of its used cars and electrical equipment. In 2004, for instance, of the three million cars taken off the road in Germany, around two and a half million were exported. However, what we are only just discovering is the proportion of these products going to other EU countries, and to countries outside the EU. We are also discovering what happens to the used goods, and the secondary resources they contain, when they are scrapped.

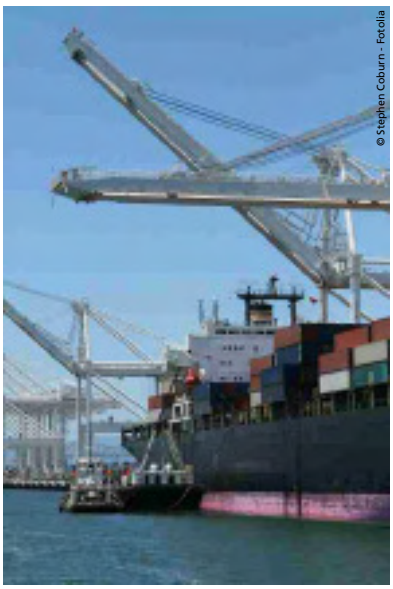
The Öko-Institut and the company Umicore have learned that, in Germany, recycling rates for high-value metals such as platinum,



Mobiles contain, among other substances, approximately silver, gold, palladium and copper.

High levels of used car exports

palladium and rhodium in several industrial applications (refineries, chemical plants and the glass industry) are very high. They exceed 80, and sometimes even 90 percent. However, recycling rates for such metals contained in consumer goods like cars (catalytic converters) and electrical equipment (PCs, mobile phones) lie at a disappointing 40 or so percent. The extent to which the stream of secondary resources from both product groups returns to Germany was unknown. One car contains on average 2.5 grammes of platinum, palladium and rhodium (platinum group metals - PGM), notably in the catalytic converter. In addition, a car will contain other valuable raw materials such as steel, aluminium, copper and lead. In contrast, there are no precise figures for exports of used electrical equipment from Germany. Yet it is clear that this equipment also holds great potential in terms of secondary resources, as illustrated by the humble mobile phone. A million mobiles contain, among other substances, approximately 250 kilos of silver, 24 kilos of gold, nine kilos of palladium and nine tonnes of copper. They also contain platinum group metals, which are of paramount importance for many industrial processes and consumer goods applications, such as catalytic converters and electronic devices.



The project took Hamburg as an example, researching the export streams of end-of-life cars and electrical equipment leaving the port, mainly for Africa and Asia.

Lack of technology puts health at risk

The primary extraction of platinum group metals as raw materials occurs in just a handful of countries, mainly Russia and South Africa. Another reason why recycling the valuable platinum, palladium and rhodium is very beneficial is that their primary extraction is associated with much greater levels of environmental pollution (by a factor of 10 to 100), in terms of both acidifiers and greenhouse gases. Consistent recovery of these valuable platinum group metals from secondary sources also protects against dependency and shortages in future.

The problem with exporting used goods to developing and transition countries is that many do not have recycling infrastructures as we would understand them, and the recovery of valuable metals performed there employs only rudimentary technology (open-air combustion, use of cyanide and mercury). This problem was highlighted at the UNEP conference in Nairobi in late 2006 in relation to exports of electrical waste from the industrialized nations. In addition to the unsustainable health and environmental risks it poses, valuable secondary resources (precious metals, copper and lead) also go missing.

However, crude recycling and waste disposal practices are not the only factors: the extended useful life of goods may mean that they are distributed more widely. Hence, for example, the lifetime of the ceramics in catalytic converters which are coated with platinum group metals is limited, it is shorter if exhaust fumes are not checked, and is further restricted by poor road conditions in the destination regions. Since exported used vehicles, which are often between 12 and 20 years old, may well be on the roads for another few years – perhaps in West Africa – we can therefore assume that the delicate ceramic structures in the catalytic converters are largely destroyed during use, meaning that the platinum group metals are distributed widely and lost to recovery.

The detailed results of the research project are due for publication by the UBA, and will soon be available to download from its website.

Andreas Hermann

info: ***a.hermann@oeko.de***
www.oeko.de/071/knowledge2

"There is no alternative to the roundtables"

Whoever takes part in the resource debate and looks beyond the confines of Germany, comes across one name very soon: Dr. Reinier de Man. The Dutchman is an expert who organizes and supports partnerships for sustainability. For instance, de Man has helped WWF and partners establish the first Roundtable on Sustainable Palm Oil. We talked to de Man to find out what he is working on, which solutions he sees and what he expects of the Öko-Institut.

Mr de Man, you have been working on resource conservation and materials flow management for many years now. Where do you see your priorities today?
By and large, my two priorities have not changed over the past 20 years. Firstly, I advise international corporations and NGOs on how they can promote and implement sustainability. Secondly, I organize international roundtables in the context of the resource debate.

But haven't circumstances changed?
Certainly, ten years ago the pure environmental themes dominated the market. Since then, priorities have shifted towards sustainability, and social aspects have gained importance. Moreover, climate change mitigation now plays a much greater role and, quite rightly, dominates the resource debate.


Dr. Reinier de Man

Does this also apply to palm oil?
Yes, of course. Quite recently we were talking about palm oil with the food industry, the retail sector, the farmers. Today, palm oil is framed largely as a renewable energy source, which presents the issue of potential competition with farming and the associated environmental problems. The interplay of environmental issues, social aspects and climate protection is becoming increasingly important and this is manifested in concrete projects on the ground.

Can you give us an example?
In Indonesia I am currently supporting a project which saves biodiversity, helps local communities and at the same time mitigates climate change. Such projects are close to my heart, because of course we cannot conserve biodiversity at the cost of local people – poverty is just too great for any such approach to succeed. But there is also an equally large danger of engaging in climate policy at the cost of biodiversity. This is why we, in our western markets, need to understand that climate change mitigation costs money and we should make our modest financial contribution.

You have already mentioned the roundtables. What role do these play in the resource debate?
There is at present no alternative to the roundtables as a way of facilitating critical dialogue. This also applies, all criticism notwithstanding, to the Roundtable on Sustainable Palm Oil which I organized in 2002 upon request of WWF. The environmental organization feared that virgin forests in Indonesia and Malaysia would be destroyed by palm oil plantations. The industry didn't see the problem. I do, however, take a highly critical view of the final outcomes of this forum, for the jointly adopted statements of intent are formulated very cautiously and lack any clear time schedule.

What have you learnt from this for other processes?
The greatest problem in the Roundtable on Sustainable Palm Oil was to tackle the land-use problems. Great strides have been made in the field of plantation management, but the problem of broad-scale destruction of virgin forests still has not been discussed openly. There are two reasons for this: Firstly, land-use issues are a government matter, which limits the scope for companies and NGOs to take action. Secondly, there was not and still is not any willingness – neither on NGO nor on industry side – to engage in open and fair debate on the costs of conserving virgin forests. There is enough land in Indonesia. There is no need to destroy primary forests, but opportunity costs do arise and we need to talk about these. Much the same applies to the destruction of the Brazilian Cerrado for soya and cotton. There is enough alternative land. The preconditions for effective roundtables therefore include, beside a clear time schedule, other minimum standards such as inclusion of the state and clear arrangements from the outset.

The Öko-Institut also works to foster resource conservation. What do you expect of us?
The climate issue is becoming dominant and there is a great danger that politicians take courageous but misguided decisions. This is why we need clear-headed system analyses and numbers from the Öko-Institut. And, of course, we also need a critical scientific voice accompanying policy processes.

Christiane Rathmann talked to Dr. Reinier de Man.

info: ***www.oeko.de/071/values***

Dr. Reinier de Man *has been running a sustainable business development consultancy in Leiden, the Netherlands, since 1989. Previously, the graduated chemist worked as associate professor for strategic management at the Rotterdam School of Management and as a senior consultant at the IMSA environmental research institute in Amsterdam.*

More application

Dr. Matthias Buchert urges greater use of existing knowledge

It all began with a short publication by the Öko-Institut about turning energy systems towards sustainability, which Matthias Buchert found after a train tour of Sweden in 1982. At the time he was still a student. Some years later Buchert began his career at the Öko-Institut while on community service. Now aged 45, with a

doctorate in chemistry, he heads the Infrastructure & Enterprises Division, working in Darmstadt on issues such as resource conservation, materials efficiency and sustainable land management. What has been the driving force behind his journey? "Put simply, we have so much still to do. The world's problems are becoming increasingly urgent. And many of the solutions already available are not being implemented consistently", he criticises. "Over the past 20 years, marketing types with a penchant for SUVs have influenced politics and industry far more than environmental scientists." But Buchert remains optimistic: "It's still not too late. I sincerely hope that today's hot environmental topics stay high up the political agenda in the medium to long term. Once they are set, targets need to be met – consistently – and the pool of knowledge here at the Institute put to good use." *kk*

info: ***m.buchert@oeko.de***
www.oeko.de/071/wishes

Less lobbying

Dr. Christian Hagelüken demands evidence-based dialogue

Although Christian Hagelüken cyclesto work, recycles his rubbish and has always been interested in environmental issues, he's not employed in environmental protection – at least not directly. Yet industry insiders know this 49-year-old industrial engineer with a PhD in mining as a good networker with a solid technical

background. He isn't cool and calculating, just fascinated by raw materials. For the past 18 years, Hagelüken has been working on recycling precious metals: first at Degussa, then at Umicore, where he is now responsible for marketing and business development. "For a long time, the issue of resources has been significantly underestimated – yet it will bring real impetus", he suggests. "If we are to take sustainability seriously, recycling is key. We can still optimize many aspects." However, Hagelüken is not a fan of quick fixes: "They're not normally the answer". He would rather seek out new ideas and alliances, and not just with the Öko-Institut. He's not backward in coming forward, either! "I'd like to see an open-ended, evidence-based dialogue between all the stakeholders. That will make much better headway than the fixed 'lobby group' mindset." *kk*

info: ***www.preciousmetals.umicore.com***
www.oeko.de/071/wishes

High commitment

Professor Paul Brunner has great expectations of politicians

Three things moved Dr. Paul Brunner to devote his work to the environmental sphere: delight in nature, awe of creation and fascination by technology. To combine all three is his goal. "I would wish that technologies help humankind to live better with creation" says the 60-year-old. Now a profes-

sor of waste management at Vienna University of Technology, Brunner has spent more than 30 years working on his "three hobbies" – urban metabolism, clean cycles and ultimate sinks. These are no easy topics, but for him they are exceedingly "fascinating". His expectations of his own colleagues are high: Professors must set a good example and should constantly develop new ideas. "If they don't do that, they do not belong in the universities" says Brunner. As concerns the body politic, Brunner expects high commitment and "more enthusiasm for quite new solutions". And, above all, the ability to keep the whole in view. He aspires to this holistic view himself, for at the heart of his vision of a sustainable future is the "satisfied, happy person and the prudent use of materials and energy". *cr*

info: ***www.iwa.tuwien.ac.at***
www.oeko.de/071/wishes

New climate protection technology raises questions

Protecting the climate is the greatest environmental challenge currently facing humankind, and carbon capture and storage technology (CCS) can help to mitigate the dramatic rise in the Earth's temperature. So how does CCS work? The climate-damaging carbon dioxide (CO_2) is captured from large point sources such as power plants and industrial sites, transported elsewhere, and stored away safely below ground instead of being released into the atmosphere. However, there are still many unresolved questions surrounding CCS:

- CCS is a new technology which requires a great deal of research and currently entails very high costs. How can these be reduced?
- What type of regulatory framework is required to allow the safe and successful application of CCS for the benefit of humankind and the environment?
- CCS is not the only option, and may not be essential in order to achieve ambitious mitigation goals. In terms of its overall environmental balance sheet, how does it measure up against other mitigation tools, especially as regards its CO2 reduction potential, economic costs and safety risks? Is CCS likely to be widely accepted by society?
- How many locations actually exist where CO_2 could be stored safely on a long-term basis?

The Öko-Institut has submitted an expert report to the Office of Technology Assessment at the German Bundestag which contains an assessment of the legal and regulatory implications of this new technology and also considers the issue of public acceptance.

According to the team of experts involved in writing the report, who work in the fields of energy and climate protection, environmental law and governance, and nuclear technology and plant safety, the research and trialling of CCS technology require a short-term interim solution. "On the other hand, the long-term large-scale use of CCS as a technology must be comprehensively regulated", says Öko-Institut environmental lawyer Andreas Hermann. "The aim is to establish clarity in the event of conflicts when exploring CO_2 storage sites and engaging in storage itself, to ensure that substantive legal standards can be defined in order to protect people and the environment, and to allow an integrated assessment to be made when granting licences for CO_2 separation, transport and storage." *ah*

Capturing CO_2 at the point of generation and storing it underground – an efficient climate change mitigation technology?

info: ***a.hermann@oeko.de***
www.oeko.de/071/investigating1

Scarce fish

Are fish fingers threatened with extinction? This question was raised recently in the serious daily Süddeutsche Zeitung. The paper actually meant cod, one of many fish species in Europe at risk due to drastic overfishing. How to stop it? "By tightening up legislation or if private stakeholders voluntarily subscribe to a system which supports sustainability", says the Öko-Institut's Miriam Dross. As part of the CEVIS study, she and her colleague Franziska Wolff are looking into innovations in fisheries management from which they can make recommendations to the European Commission. For example, fishing quotas in Alaska are set according to the principle of proportionality: the less is known about the stock of a particular fish, the more strictly it is managed.

For a long time, cod was the main species in fish fingers.

Another initiative is illustrated by the wild salmon sticks produced in Germany by fish processing company Gottfried Friedrichs KG: they are made from MSC-certified fish which is sustainably managed. The Öko-Institut is investigating this type of voluntary corporate initiative as part of the EU's RARE project. *md*

info: ***m.dross@oeko.de***
www.oeko.de/071/investigating1

A fresh look at closed-loop materials management

The German government has set itself a sustainability strategy target: by 2020, it wants to raise Germany's raw materials and energy productivity to twice their 1994 and 1990 levels respectively. If Germany is to achieve this goal, while conserving resources, life-cycle management will be more crucial than ever. How can these measures develop into truly sustainable resources management? What trends are emerging, and what scenarios can picture for the future? Where can savings be made in raw materials, energy and greenhouse gases? The Öko-Institut was commissioned by the environment ministry to answer these questions, and has investigated particularly relevant materials flows. It found that:

"As regards the materials flow system 'iron ore>steel>automotive industry>car purchase', in the medium to long term, savings of up to 15 million tonnes of CO_2-equivalent could be made each year in steel production alone (compared with 2002 levels)". Project coordinator Dr. Matthias Buchert explained that this would mainly be achieved by using more scrap metal and increasing the proportion of production via the electric steel route. He noted that, for automotive production, reducing the weight of vehicles is the key – this not only saves resources in production, but also saves significant amounts of fuel while the vehicles are in use.

However, any future life-cycle management will hinge on the reservoir of materials embodied in buildings and infrastructure: "Germany is a developed, industrial economy with an established infrastructure, and as such holds major potential in terms of the secondary resources like steel, aluminium, copper and concrete", Buchert states. "This potential lies dormant in empty residential and office buildings, in workshops and in unused or underused infrastructure." According to the philosophy of "urban mining", and bearing in mind future developments in population, this potential will have to be exploited to a greater extent in years to come. The experience gleaned by the new German states as they manage their "shrinking cities" could supply valuable ideas for the whole country, and indeed other countries, to follow up in future. *mb/kk*

Making cars lighter saves vital resources.

info: ***m.buchert@oeko.de***
www.oeko.de/071/investigating2

Dentists' x-rays

Whether for wisdom teeth or gum disease, sometimes an x-ray is unavoidable. Yet x-rays also pose a risk, although any exposure of patients to radiation is at least minimized if the operator keeps within diagnostic limits. Unfortunately, as the Öko-Institut's Mathias Sering points out, no such limit values exist for the dental profession. However, this could be about to change: the Öko-Institut and the Medical Radiation Physics Working Group from the University of Oldenburg have now found diagnostic limit values that can be introduced for three types of x-ray examination. "Practical experience has shown that patient exposure during an x-ray depends greatly on the type of apparatus used. However, dental practitioners also use different settings, so the same examination can lead to different levels of exposure. Dose reference values are therefore an important way of optimizing the use of settings which give a high dose of radiation" says Sering, "– especially with x-rays of children, who are particularly sensitive. Many pieces of equipment actually have special children's settings." *kk*

X-ray exposure? Get the settings right!

info: ***m.sering@oeko.de***
www.oeko.de/071/investigating2

What if …

… there was an Environmental Code

… which went beyond restating existing requirements?

"It all depends on the context", is the lawyer's stock response. But what is the context – what exactly do we mean by an Environmental Code? Well, Germany has hundreds of separate laws and regulations on the environment. They relate to areas like climate protection or the efficient use of electricity. These laws state how to handle the air, earth and water, authorize industrial facilities and control waste and noise. They also deal with highly toxic chemicals and nuclear power plants. What Germany doesn't have – although it has been under discussion since the 1970s – is an Environmental Code to combine all these provisions. As a result, German environmental legislation is opaque and fragmented. So why not do what the Federal government is planning and introduce an Environmental Code?

This represents a golden opportunity to create a body of modern environmental legislation which will not only combine the existing provisions but also bring advances, impetus, fresh solutions and high environmental standards. For many years, Germany was a world leader on environmental protection, carving itself out a niche in the export of environmental technologies and playing a pioneering role in developing international environment policy on air quality, climate protection and waste management. This is no longer the case, and not just on climate protection. EU Environment Commissioner Stavros Dimas said recently "Germany is really making an effort, but at the moment it is by no means leading the pack".

Yet an Environmental Code could turn things right around: Germany could finish what it started all those years ago. For instance, if industry once again set itself high environmental standards, developed cutting-edge technologies and exported these around the world, thus creating a competitive advantage. Another way to take the lead is to oblige industry to emit less pollution into the air, earth and water, which would also benefit other sectors. Productivity in agriculture would increase, and industries requiring clean water would spend less on water treatment.

But in truth, everyone benefits from higher environmental standards. We all benefit from the improvements wrought by modern environmental legislation: less air pollution, no lead in petrol or a ban on asbestos. So if we all win, how can there be any losers? The losers are people who refuse to change and think they can ignore developments in the environment and society as a whole.

Do I really have nothing to lose? What if this new Environmental Code is a retrograde step, rather than a giant leap forward? What if the "exaggerated" requirements are watered down, as industry suggests, and what is billed as simplification of laws ends up as eradication? Then Dimas' words on climate protection will be true of the environment as a whole: "Only once Germany puts all the nice speeches into practice will the others no longer be able to hide. If Germany blocks, the rest of Europe doesn't play along. And if Europe doesn't play along, neither does the rest of the world. In that case, we might as well all pack our bags"

Miriam Dross

Miriam Dross *is a researcher in the Environmental Law and Governance Division, and is based at the Öko-Institut's Berlin Office. She is a jurist who has been with the Institute since 2002 and works on areas including the Environmental Code, public procurement law and fisheries.*

info: ***m.dross@oeko.de***
www.oeko.de/071/prompting

Inspiring a sustainable future

Öko-Institut turns 30: Anniversary conference and ceremony

What sort of sustainability policy is needed to meet the challenges to society over the next 30 years? What role will the Öko-Institut play in shaping it? Our anniversary conference will address these issues, and many more besides, as well as celebrating the past 30 years. The Institute in Freiburg will play host to the conference on Friday 22 June 2007. A multitude of speakers from the worlds of politics, science and industry will join Europe's leading environmental research agency to cast a critical eye over the challenges facing sustainability now and in years to come. The keynote speech will be given by Klaus Töpfer, former Executive Director of UNEP. In the evening, a celebration featuring live music will provide a light-hearted look back at the day's agenda. The venue is the Historisches Kaufhaus, Freiburg.

To register, or for further information, see www.oeko.de/30-years or call +49 (0)761 452 9524. *cr*

Reading resource

Climate history for everyone

What is the difference between weather and climate? How does the ozone layer protect the Earth? And what's the truth behind the Biblical story of the Flood? You can find answers to these and other fascinating questions in Karl-Heinz Ludwig's book Eine kurze Geschichte des Klimas (A short history of climate). Anyone who is interested in delving into the topic of climate, weather etc. shouldn't hesitate – this is the book for them.

Drawing on the most recent research, the author provides a concise and readable overview and explanations of climate history "from its origins to the present day". In the last of 14 chapters, entitled "When, how and why the Earth System will end", Ludwig pulls no punches. In a frankly gloomy discussion of global warming, he tries to jolt his readers awake, showing that action is needed now if climate change is to be avoided.

Ludwig's particular strength is his ability to present complex issues in an accessible way. Not that he abandons the climatologist's specialist terminology altogether – but he uses it so cleverly that even non-experts can understand. This book is as readable as a novel. Given the urgency of climate change, Ludwig's book is well worth reading: whether you are already a climate expert or merely aspiring to be one, this is a very useful reference work on all climate-relevant issues. *cs*

Karl-Heinz Ludwig: Eine kurze Geschichte des Klimas – Von der Entstehung der Erde bis heute (A short history of climate – From the Earth's origins to the present day), Verlag C.H. Beck, Munich 2006, 216 pages, ? 12.90. ISBN-13: 978-3-406-54746-1.

Environmental Law & Governance

This is the new name of the long-standing research division at the Öko-Institut which integrates input from lawyers, social scientists, economists and natural scientists.

"For some time now, we have been concerned not only with classic environmental law, but also with other forms of societal regulation and governance" says coordinator Regine Barth. The core purpose is to identify which instruments – including classic regulatory law, economic instruments, voluntary agreements, corporate social responsibility (CSR) or participatory processes – are particularly effective to attain environmental policy goals. The range of issues is broad, taking in waste management and emission control, transport and planning law, and management systems in the spheres of biological diversity, farming and fisheries. *fw*

info: ***r.barth@oeko.de***
www.oeko.de/071/discovering

News

Dr. Joachim Lohse, Öko-Institut Director, has been appointed to the jury of Novartis AG which selects the winners of the Novartis Energy Excellence Awards each year. The pharmaceutical company uses this award scheme to reward staff worldwide whose projects have boosted renewable or alternative energy technologies or whose behaviour has been an exemplar of energy efficiency.

Christiane Rathmann, head of public relations and communication at the Öko-Institut, has been elected deputy board member of the Legacy for the Future Foundation. She replaces Ilka Raven-Buchmann, who has stepped down for personal reasons.

Öko-Institut turns 30 – our anniversary edition

Back in 1977, 27 citizens came together while protesting against the Wyhl nuclear power plant, and formed the Öko-Institut. They were interested in conserving an environment which they witnessed being exploited with increasingly reckless abandon. Over the years, the considerable combined knowledge of our founders and contributors has created one of Europe's leading independent research and advisory facilities on sustainability. And now, the Öko-Institut is putting together a 30th anniversary edition of eco@work.

What are the Institute's abiding memories of its 30 years of research and advice? Can we imagine a world without an Öko-Institut? Where should the Institute's focus lie in future? You can expect many questions, fascinating answers, and reviews and previews in the next edition. Watch this space: it will be published in June.

30th anniversary
1977-2007
Öko-Institut
Inspiring a sustainable future

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