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Sustainable reading from the Öko-Institut

In motion

Novel strategies for sustainable mobility

Needed More efficiency in freight

Sought Hydrogen tanks

for cars

Honoured

Dr Axel Friedrich A portrait

Hanover: Where the

Car-free automobility - the way ahead

annual season ticket for bus and tram, 25% discount on rail travel, and membership of a car-sharing club – all-inclusive. Add in cheaper taxi fares and discounted car rental, reduced charges for left luggage and even a home delivery service for your baggage – in your dreams? No – this is the norm in Lower Saxony's capital Hanover. And it costs just 6.5 euros a month more than a standard annual season ticket for the local transport network. The scheme, known as Hannover mobil, is designed for people who want to cope without a car – and treats the customer like a king.

"Our intention was to tie our customers into our core bus and rail services by offering a comprehensive package of attractive mobility options", says project leader Martin Röhrleef from local transport provider Hannoversche Verkehrsbetriebe. Protecting the environment was certainly a factor – but one among many. The publicity focussed primarily on other aspects: mainly convenience and mobility. The unspoken objective is to make it easier for local people to cope without a car and thus cut congestion in the city. And this has been successful, largely because the local transport services are carefully integrated at affordable prices. Martin Röhrleef calls it "car-free automobility".

Hanover's local transport provider issues around 80,000 annual season tickets and 700 of these customers have opted for Hannover mobil, says Röhrleef. Around a third is new business. It's a good result, and so the scheme which started as a pilot project in 2004 is now being offered on a permanent basis from 2007, to wide acclaim, not only in Hanover. Hannover mobil is a headline project in the mobility offensive launched by the Federal Ministry of Transport, was awarded the ÖPNV Innovation Prize in 2005, and won an award for outstanding customer service from Verkehrsclub Deutschland (VCD). *kk*

info: www.oeko.de/062/smallmiracles



customer is king



Öko-Institut Director Dr Joachim Lohse in conversation with Parliamentary State Secretary Astrid Klug at the Annual Conference in Berlin.



A welcome guest at the Annual Conference in Berlin: Hanne Tügel, Öko-Institut Executive Board member.

Dear reader,

Can you imagine a world without mobility – the key to our prosperity and quality of life? But mobility has one major drawback – the massive environmental cost. We have known for some time that making our mobility systems more sustainable is the only way forward – but the strategies pursued so far have not delivered the success hoped for. So how can we respond to this challenge? Integrated intermodal systems for passenger and freight transport offer the solution, according to the researchers from the Öko-Institut – and they are working intensively to develop appropriate strategies. Read more in our "Big Ideas" sections under Uncommon Knowledge, Key Notions and Core Values.

Alternative fuels and drive systems play a major role in implementing these new approaches and therefore featured on the agenda at the Öko-Institut's Annual Conference in late September in Berlin. The Conference aimed to explore the tension between effective, challenging sustainability policy and the competitiveness of the European Economic Area. Around 170 delegates from politics, science and business discussed why tough social and environmental standards pose no threat to Germany's appeal as a location for business and investment. You can access many of the conference documents on the Internet at www.oeko.de/jahrestagung.

All that remains is for us to wish you a Merry Christmas and a flying start to 2007 – the year when we will be celebrating the Öko-Institut's 30th anniversary. Will you be joining us? We do hope so!

With warmest wishes

Katja Kukatz, journalist with the Department of Public Relations & Communication, k.kukatz@oeko.de



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Towel dispensers: Fabrics first

Cotton beats paper

Be it in restaurants, companies or public buildings: In almost every place where people wash their hands there are also towel dispensers. But differ-



ent systems impact differently on the environment. A study produced by the Öko-Institut on behalf of the European Textile Services Association E.T.S.A. now reveals that reusable continuous cotton rolls are a much better choice in environmental terms compared to disposable paper towels - with the same

functionality. The Life Cycle Analysis shows: From resource extraction through to final disposal, the cotton roll generates less waste and greenhouse gases, consumes less energy and contributes less to summer smog and the acidification and over-fertilization of soils and waters. For instance, compared to paper towels, cotton rolls generate only about one-half of the CO₂ emissions that cause global warming. There are good reasons for the excellent environmental performance: Cotton rolls can be washed up to 100 times and reused; more-over, they usually have a second life as cleaning cloths.

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Nanomaterials risk assessment

Experts call for REACH coverage

Be it in the automotive industry, chemical industry or medicine – nanomaterials, i.e. structures such as particles, layers or tubes of a dimension smaller than 100 nanometres, are already being used or researched today in important branches of industry. The future market potential is huge. Nanotechnologies are considered key technologies of the 21st century. Yet little is known about the potential risks presented by nanomaterials to people and the environment.

To what extent is European and national environmental legislation suited to regulating the use of nanomaterials in such a way that potential risks are recognized and controlled? Where is there a need for further regulation? To answer these questions, the German Federal Environment

The fair trade notebook

Socially responsible computer production is possible

In the past 20 years, the manufacturing of electronics products has been shifted almost entirely to sites in eastern Asia. Working conditions there are often poor, infringements of international standards and national labour law frequent. A new study by the Öko-Institut now shows, taking notebook PCs as a case study, how working conditions can in fact be improved and consumers can have a clearer idea about how the computers are made. "In four years at the latest, the first fair trade computer will be available on the market," forecasts Dr. Rainer Griesshammer, Deputy Director of the Öko-Institut.

At present, almost all notebook PCs distributed by the major own-brand makers are in fact manufactured by low-profile Taiwanese companies on the eastern coast of China. This industry employs about 75,000 people in that region. In view of high levels of unemployment, the notebook industry is thus an important regional employer, contributing to reducing poverty. But there are also many negative aspects. On almost no indicator do living and working conditions meet European standards. Moreover, wages are generally set at the minimum legal wage, which, corresponding to about 69 Euro per month, is more than meagre.

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Agency has commissioned the Öko-Institut and the Society for Institutional Analysis (Sofia) to produce a legal expertise.

The experts' urgent recommendation is: "REACH, the pending European Union regulation on chemicals, must be amended so as to cover nanomaterials and to identify potential risks," says Andreas Hermann, legal expert at the Öko-Institut. "In those branches of environmental law concerned with the specific environmental media, such as clean air law and water law, the way in which nanomaterials are regulated depends critically upon the way risks are identified and evaluated under REACH." *kk*

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Acid climate change

Study on the future of the oceans

First the good news: Climate change could improve living conditions for commercially important fish species such as cod and herring. In every other respect, however, the impacts of climate change, which is largely brought about by CO₂ emissions, upon seas and coasts and thus also upon humankind will be as follows: Food scarcity, more severe hurricanes and millions of people who have to be resettled to flee from rising sea levels. And there is a brand new threat – acidification of the oceans.

This is the scenario painted by the German Advisory Council on Global Change (WBGU) in its latest special report titled "The Future Oceans – Warming Up, Rising High, Turning Sour". In the past, the seas were thought to be a natural sink for carbon dioxide. The WBGU scientists now prove that seawater is becoming increasingly acidic due to its absorption of the greenhouse gas, and that this is threatening marine ecosystems and food webs.

Dr Rainer Griesshammer, WBGU member and Öko-Institut deputy director, leaves no doubt that measures must now at last be taken to drastically reduce carbon dioxide emissions: "Two disasters are looming – massive climatic changes and acidification of the oceans. This is surely cause enough to take action rapidly." WBGU calls for global greenhouse gas emissions to be cut in half from their 1990 levels by the year 2050. dw

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Social responsibility:

Testing tomatoes

How much social responsibility is in a tomato? Öko-Institut scientists have tackled this question all across Europe on behalf of the International Consumer Research and Testing Organization (ICRT). They travelled to Spain, France and Italy, and inter-

viewed the leading supermarkets in eight European countries. The findings in brief: A fair deal is already being done to promote environmental performance and social equity in tomato cultivation, but in intensive farming many problems persist, no matter where the tomatoes come from. And: As large procurers, the supermarket chains wield decisive influence over the cultivation methods used by producers.

"The greater the price pressure exerted by supermarkets upon their suppliers, the more problematic are environmental and workplace conditions in production," says Katharina Schmitt of the Öko-Institut. "But there are also supermarkets that insist on environmental and social standards in tomato production and check these regularly." For such behaviour to be rewarded, however, supermarkets need to inform their customers about it. For this is the only way that consumers can make conscious shopping choices and thereby support fair working conditions and environmental performance. *hw/kk*

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Managing land development

Komreg workshop in the Solar Ship

March 2006 saw the launch of a research project funded by the German Research Ministry and headed by the Öko-Institut, titled komreg – "Municipal land management in a regional setting". The participants are truly representative of the entire Freiburg region. In addition to the city of Freiburg itself, they include the municipalities of Au, Ballrechten-Dottingen, Breisach, Emmendingen, Hartheim, Herbolzheim, Merzhausen, Titisee-Neustadt, Schallstadt and Umkirch. The Baader Konzept GmbH consultancy in Mannheim and the Institute for Urban and Regional Planning IfSR complement the komreg research grouping with their special expertise, covering, among other things, the aspects relating to land registries and the cost-effectiveness of site development. All the partners from science and the participating municipalities met for debate at a first project workshop in the Öko-Institut's Freiburg Solar Ship. The meeting centred on first mid-term findings on the potential to develop land vacancies and increase the density of development in built-up areas in two of the partner municipalities. These findings will be used in further project phases to identify the potential achievable for residential construction by 2020/2030 – i.e. the amount of land that can be activated. The experts will use scenarios to compare the potential with the anticipated future need for residential housing, and will home in on particularly cost-effective aspects. *mb*

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In motion

Demand for mobility services is mounting steadily, presenting major challenges in terms of climate protection and sustainable resource use. Strategies responding to these challenges need to be integrative and practicable.



9

Improved efficiency, alternative drive systems and renewables-based fuels are key elements of more sustainable mobility. But renewables are also the heartpiece of a sustainable system of energy supply. How can resource conflicts between the two sectors be resolved? The "renewbility" programme is looking for answers.



cause considerable greenhouse gas emissions and other forms of environmental damage. This must be taken into account in the overall appraisal.

"Assessments of emissions reduction contributions and associated costs are already available for most alternatives," says Christian Hochfeld, Deputy Director at the Öko-Institut. "What we now need is an exploration of how the most promising approaches can be brought to the market as concrete packages of measures, and how barriers can be removed." And here yet another aspect arises: How to ensure climate-friendly energy supply at the same time.

For strategies in both fields build upon renewable energies. But the scenarios calculating which percentages of future demand for power, heat and alternative fuels can be met from renewable sources often only consider one of the two sectors: mobility or energy supply. "We continue to lack an integrated assessment that takes in both sectors with equal standing and allows development of an overall strategy to resolve competition over resources," says Öko-Institut energy expert Uwe Fritsche.

The German Environment Ministry is now funding a joint programme intended to perform this integrative step – "renewbility". Working together with the German Aerospace Center and other partners, scientists at the Öko-Institut are elaborating a framework to explore how mobility demand can develop and which services can

modern society and the globalized economy. This has its price: In Germany, transportation causes some 20 percent of total greenhouse gas emissions. Considering the immense economic and social damage that climate change is threatening to wreak, there is little doubt that mobility must become more sustainable. Greater efficiency in consumption, the introduction of alternative fuels and drive systems, and enhanced alliances among all transport providers in order to boost environmental performance are cornerstones of such a sustainability strategy. Much-discussed building blocks include: biomass-derived fuels, natural gas or hydrogen from renewable sources, and alternative drive systems such as electric, hybrid or hydrogen combustion motors or fuel cell vehi-

Until these options have become ready for the market, however, major technological and financial challenges yet remain in some areas. For instance, the overall environmental impact of biofuels can differ widely depending upon the production chain. Unsustainable crop cultivation methods can

cles.



Which alternative fuels offer the best long-term outlook – ecologically, socially and economically?

Looking to

2030

be deployed to meet that demand in a sustainable manner. "We will develop an analysis tool allowing us to study in detail the potentials and barriers for sustainable mobility," says Dr Wiebke Zimmer, researcher at the Öko-Institut. Particular attention will

centre on the interplay with efforts to promote renewable energies. But "sustainable mobility is not just a matter of tech-

nologies, but also of the visions of future mobility systems that prevail among mobility providers, energy and fuel companies, vehicle manufacturers, final consumers and politicians," stresses Zimmer.

The group is launching a comprehensive analysis of the mobility supply and demand side. This will generate the foundation for a range of scenarios to be produced in close cooperation with stakeholders and reviewed in terms of their impacts by means of material flow analysis. Analysis extends to the year 2030. How can mobility develop in a sustainable fashion? How can traffic volumes be reduced and shifted to environmentally sound modes? Which

> alternative fuels and drive systems offer the best environmental, social and economic performance over the long term? Which policy measures will be

needed to establish them on the market? Uwe Fritsche is certain that "analysis of the scenarios will provide first answers to these and other questions and will reveal scope for policy action. We have high hopes that this will generate new momentum for more sustainable mobility in Germany."

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Biofuels in brief

Biofuels are produced from biomass and can be grouped in chemical terms according to fuels derived from plant oil, alcohols, biogas, synthetic fuels and hydrogen. Biofuels are CO₂-neutral upon combustion. To assess the entire energy inventory and environmental inventory, however, the full lifecycle from cultivation of plant feedstocks over harvesting and further processing through to use in vehicles needs to be examined. For instance, cultivation methods that lead to the clearing of rainforests, give rise to monocultures, are based upon applying great quantities of pesticides and fertilizers, make use of genetically modified organisms or compete with food production lack sustainability. Experts are therefore calling for certification in accordance with sustainability criteria. The Öko-Institut has recently proposed a scheme for this purpose.

Plant oil, biodiesel derived from plant oil such as rape oil methylester (RME), and bioethanol produced by fermenting starch-containing feedstocks are **"first generation" biofuels** and are already available today. As only a part of the plant can be used to produce the fuel, yields are comparatively low. In Europe and the USA, sugar beet, cereals or potatoes are the main feedstocks. Sugar cane, palm oil and similar perennial oil plants are also used. These feedstock plants grow mainly in tropical and subtropical areas and have very high yields per unit land. Producing bioethanol or biodiesel from them is already economical today. Imports of such fuels, however, are only sustainable if cultivation systems are appropriate and must be certified accordingly.

"Second generation" biofuels are produced by gasifying biomass with subsequent synthesis (biomass to liquid, BtL) or by biochemical conversion of cellulose (straw or wood) to ethanol. The whole plant can be used to produce fuel; so can biogenic residues. Energy yields are higher and the greenhouse gas inventory is better than that of first-generation biofuels. BtL and bioethanol can be used in a pure form or as an admixture to fossil fuels. These fuels, however, will only capture appreciable shares of the market in ten years at the earliest.

Biogas, a further important biofuel, provides better environmental performance and lower cost. This can be produced both from residues and from energy crops. **Biogas** has significant advantages, even compared to second-generation biofuels, and is already available today. Nonetheless, the number of vehicles that can run on biomethane as a substitute for natural gas is still very small in Germany. The market potential is thus very limited, at least in the near future.

A further option not yet implemented but technically feasible is to produce **hydrogen from biomass**. As yet, hydrogen is produced either from natural gas or, by means of electrolysis, from water – this, however, needs electricity. Faster, greener, cheaper ... and more flexible and reliable

Boosting the efficiency of freight transport

Swabian yoghurt made from Polish strawberries, Swiss whipped cream in Belgian spray cans, or snow from St Gotthard on the Black Forest ski jump: nowadays, by the time many products arrive at their destination, they have travelled very long distances, often quite unnecessarily. Land consumption, health problems and climate damage are the result. Freight currently accounts for around a fifth of the greenhouse gas emissions produced by Germany's transport sector - and the freight industry is expanding, especially on the roads.

But why has there been a shift away from rail and waterways to the roads – a process which began in earnest in the 1970s and is still continuing today? Key factors, according to experts, are the changed structure of the freight itself and what they call the "logistics effect". "Bulk goods such as coal and steel that were typical in the 1970s could be moved most efficiently by water and rail", Many innovative solutions are being explored. But which ones are likely to deliver?

says Martin Schmied, Öko-Institut's sustainable mobility expert. "But modern consumer goods are well-suited for road haulage as well." The shift towards

production processes that are based on prompt, small-scale deliveries, along with low transport costs, are also steadily increasing the volume of road freight. "With road haulage, companies can save so much on warehousing and

wages that transporting goods thousands of miles would still make economic sense even if transport costs were to increase significantly".

Environmental groups and some policy-makers are now calling for more vigorous promotion of new vehicle technologies and a shift back to rail – the greenest mode of transport – in order to make the freight industry more sustainable. "But we also need more efficiency in freight operations, especially in the dominant segment, namely road haulage", says Martin Schmied. "We think there is

With funding from the Federal Ministry of Education and Research, the Öko-Institut is working with Deutsche Post World Net and the University of Dortmund to develop the building blocks of a corporate strategy aimed at cost-effective and efficient reduction of greenhouse gas emissions in the courier and express parcel services industry. This sector is experiencing strong growth and is responsible for an increasing share of greenhouse gas emissions.

> major potential here. What is lacking, however, are realistic, practical implementation strategies." In Schmied's view, the key features of more efficient freight operations are better utilization of capacity, optimized routes, and intelligent integration of intermodal logistics chains.

> This applies, for example, to the hinterland connection of sea and inland ports, which are already struggling to cope with a booming

The route to efficiency: Intelligent intermodality linking ship, rail and road





Growing apace: Freight transportation volumes have risen by 41 percent between 1990 and 2000.

In demand: the opinion of logistics experts instance, instead of unloading freight goods off the ships and into trucks at the Port of Hamburg and transporting them by road to the Berlin/Grossbeeren transshipment depot, from where they are then moved once again to the stores in the centre of Berlin, goods could be shipped from Hamburg along the inland waterways directly to Berlin's trimodal inner city logistics centre. Using the railways is another option. "But there are problems with capacity here as well, and freight transport also has to compete with passenger movements in this sector", Schmied admits.

container transport industry. For

Increasing efficiency in the freight transport sector is far more difficult, says Schmied, than achieving improvements in passenger transport. This is because freight transport is extremely diverse. In Germany alone, there are around 55,000 road haulage operators, specializing, for example, in bulk haulage, general freight, or courier and express services. Most of them are small and medium-sized operators for whom investing in environmental measures entails a far higher financial risk than for major logistics companies. "We

Master plan for freight transport and logistics

In cooperation with the business community and with support from academics and experts, the German Government is currently preparing its master plan for freight transport and logistics. The aim is to produce a practical strategy for action to improve the freight transport system. The watchwords are enhancing responsiveness, improving profitability, and boosting efficiency. Info: www.bmvbs.de A growing freight transport sector

The German Ministry of Transport forecasts growth in total freight transport in Germany of 63 percent by 2015 against the 1997 baseline, from approximately 450 billion tonne-kms in 1997 to around 570 billion in 2007. In 2005, around 77 percent of the total freight haulage volume in Germany was transported by road. Haulage accounted for around 34 percent of Germany's total CO₂ emissions from road transport, and this figure is predicted to rise to 40 percent by 2030.

Source: IFEU, Heidelberg & Statistisches Bundesamt, Wiesbaden

will only be successful if we offer precisely tailored solutions for each target group. And these solutions should not only ease the burden on the environment but offer commercial and economic benefits at the same time", emphasises Martin Schmied.

Identifying these solutions specifically for road, rail and inland waterway transport - is the aim of a new research project commissioned by Germany's Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and managed by the Öko-Institut in cooperation with the University of Dortmund and the Fraunhofer Institute for Material Flow and Logistics. "Our aim is to present three to six especially promising innovations at the end of the project and show how they could be established successfully." This will take place in a multistage process. The results will flow into the "master plan for freight transport and logistics" which the German Government plans to adopt before the end of 2007. A particularly important element of the project, from the researchers' perspective, is the involvement of leading experts and practitioners from the logistics industry. Their role is to assess whether the innovations currently being mooted in the freight industry will make transport services faster, greener, cheaper, more flexible and more reliable.

The measures currently under discussion include double-deck container transportation on specific rail routes or the introduction of new non-standard-sized containers for better utilization of cargo space. Other options are computer-based information systems for "last mile" logistics to optimize route planning, or the introduction of an Internet advice and service platform for rail freight to facilitate carriers' access to the rail network. Alternative transshipment technologies which enable transshipment to take place without a gantry crane in an intermodal transport system are also being discussed.

"We will start by providing an overview of the freight sector which will also consider new initiatives from the expert groups. After that, we will carry out a systematic assessment of all the measures against eco-efficiency criteria, which means taking account of both economic and environmental factors", explains Dr Wiebke Zimmer from the Öko-Institut. Based on this assessment, the researchers will then pinpoint the most promising solutions and devise practical strategies to establish them in the market place, again drawing on the opinions of the experts and practitioners.

"A systematic analysis of how we can boost the efficiency of freight transport is long overdue. There are no off-the-peg solutions, but we are confident that by bringing together transport and logistics experts, on the one hand, and environmental and green technology experts, on the other, we are on the right track", says Martin Schmied. "We believe we are on course to deliver the major progress that is needed."

Katja Kukatz

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"Hydrogen is a long-term alternative"

Anyone working on sustainable mobility has to think about alternative fuels. In this context, hydrogen is frequently discussed as a possible option. In a new study commissioned by the German Federal Environment Agency (UBA), scientists from several research institutes have been looking at exactly what contribution various alternative fuels could make to reducing greenhouse gas emissions and

What exactly do experts mean by renewably generated hydrogen, Dr Pehnt?

Hydrogen is the most common element in the universe – but to make hydrogen available for use as a fuel, energy is required to separate it from substances which contain hydrogen, such as coal, gas, biomass or water. And to separate hydrogen from water by means of electrolysis, electricity is required. The term "renewably generated hydrogen"

indicates that a renewable energy source was used to produce the hydrogen. Hydrogen can be produced using wood, biomass, wind or hydropower – these are all options.

What are the benefits?

The use of renewably generated hydrogen can considerably reduce greenhouse gas emissions – especially when combined with efficient fuel cell technology. We can also use a wide range of fuels to produce

hydrogen. This means that in the long term, we could wean ourselves off oil as the main source of energy for our transport systems.

How likely is it that we will all be filling up with hydrogen within the next five years?

I think that hydrogen is an important option for the long term. In the short term, however, there are various problems, especially developing a hydrogen infrastructure and ensuring a supply of affordable renewable electricity – for we have to accept substantial losses in the hydrogen conversion process – and in developing a market-ready hydrogen powered vehicle. Fuel cell technology simply has not evolved as quickly as we would have wished. There is also no role for hydrogen in a wasteful fossil-fuel and nuclear-dependent world. The development of more fuel-efficient vehicles and a real commitment to renewables expansion in other sectors are the key prerequisites for the market launch of hydrogen technologies.

How can a system of hydrogen filling stations be developed?

Focussing on the hydrogen option too early on distracts attention from the real issue, which is to reduce overall energy consumption by means of a stringent energy efficiency strategy and thus create scope for the development of sustainable supply structures. For that reason, the development of largwhat the associated costs would be. A key focus of interest was on renewably generated hydrogen. What are the prospects for this technology in the near future? eco@work author Christine Strauss talked to one of the authors of the study, Dr Martin Pehnt from the Institute for Energy and Environmental Research (IFEU).

er-scale hydrogen systems should focus primarily on pilot projects that show promise for specific niches, such as fleet vehicles or motorized two-wheelers. We also recommend concentrating hydrogen research on those key areas in which major progress must be made in order to pave the way for more broad-based introduction of hydrogen in a few decades, e.g. the development of efficient hydrogen storage systems. I believe that the gas infrastruc-



Dr Martin Pehnt

ture has a key role to play. A progressive shift towards hydrogen can be achieved by developing a network of local suppliers who produce hydrogen from natural gas, for example. Over time, biogenic gases – such as slurry gas or gas from sustainable sources – could be fed into the natural gas grid. These biogenic gases produce very high energy yields and can thus pave the way for the hydrogen age.

Petrol and diesel prices are very high at present and consumers are very sensitive to this issue. Do alternative fuels offer an affordable alternative?

Renewably generated hydrogen is even more expensive at the moment. However, tax benefits are already available for biofuels and in future, the oil companies will have to mix in an increasing proportion of biofuels, which is why biofuels' share of the market is currently experiencing very dynamic growth. We will have to adapt to rising oil prices as a long-term trend – and that will really shake things up.

Can drivers whose vehicles are powered by petrol or diesel convert their cars to hydrogen? Hydrogen can be used to power fuel cell vehicles –

which are essentially electric cars – but it is also suitable for use in combustion engines, and a few people are already converting their cars to hydrogen. But the devil is in the detail. For normal consumers, conversion is unlikely to be a realistic prospect within the next twenty years – and won't make economic or environmental sense.

Dr Pehnt, thank you for talking to eco@work.

info: www.oeko.de/062/corevalues

No role for hydrogen in our wasteful fossil and nuclear world

Dr Martin Pehnt

has worked at the Institute for Energy and Environmental Research (IFEU) in Heidelberg for five years. The 36-year-old physicist is a Senior Scientist in the "Future Energy and Transport Systems" Division.

Unfazed

Martin Schmied believes in workable compromises

All-or-nothing solutions? Martin Schmied shakes his head. No, today's environmental problems are far too complex for such a simplistic approach. According to the researchers at the Öko-Institut, what is needed are workable compromises which offer positive opportu-



nities. Transport is one example. Martin Schmied is a firm believer in affordable mobility for everyone. But it needs to have minimal impact on the environment, which means being climate-neutral. There's no point, says Schmied - a graduate engineer and specialist in environmental technology - in simply trying to change the behaviour of transport users through awareness-raising. Instead, the focus should be on delivering an attractive range of services that are attuned to passengers' needs but are also sustainable. As the Öko-Institut's expert in sustainable mobility, tourism, leisure and sport for the last seven years at its Berlin office, Martin Schmied has always kept faith with this principle. Transport is a key topic in all his reports, and has been something of an obsession for years. "No other sector affects every single one of us so much in our daily lives and yet still remains largely unresolved", he says. Schmied is unfazed: finding the solutions is a fascinating challenge. cr

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Honoured

Axel Friedrich at the forefront of sustainable mobility

When Dr. Axel Friedrich thinks back to when his passion for environmental themes was born, he remembers a situation at university. He was dismayed that chemicals in the lab were not being disposed of properly. Since then, the chemical technician, chemical engineer and present-day head of the transport and noise department of the German Federal Environment Agency has remained



devoted to green themes. And what has also remained is his motto: "Saving the world". In the field of transport, for instance. The 59-year-old wishes to see cities "in which people can live the way they want to live". Instead, city-dwellers often have to make do with an urban environment actually designed for cars, not people. Or they suffer the noise that makes them ill. Friedrich finds both situations intolerable and in urgent need of change. He sees the Federal Environment Agency's task as twofold: "As a science authority, we take up issues that others have not yet thought about." The experts then strive to "translate" the solutions for the public. Friedrich is convinced that "Only if we can convince politicians and people will something change". Details about the award: www.oeko.de/062/keynotions cr

info: www.oeko.de/062/keynotions

Up and away

Mandy Helmis lives her dream of a sustainable world trip

From Essen over Vienna, Budapest and Istanbul to Teheran - and that's just the start. 27year-old speech therapist Mandy Helmis set off in April this year together with her friend Benjamin Jacob to cycle around the world on a tandem. When they return, in three years from now, Mandy will have travelled 60,000 kilometres and will perhaps have a place in the Guinness Book of Records. Mandy and Benjamin "quite consciously chose the bike as the means of transport for our journey, as this both permits us to travel greater distances and to go slowly and really get into contact with places and people". Mandy Helmis is trying "just to see and experience things without



making judgements", such as on the behaviour of the other people on the road. While in Romania she still met friendly horse-drawn carts, in Hungary she was hooted at and cut in on. In Turkey, diesel soot was a constant and unpleasant companion. It is not just because of these experiences that Mandy thinks "Clean means of transport should be matter of course in tomorrow's world". She thinks a drive in the car around the corner "quite nutty" anyhow. dw

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Regulating active networks

Electricity continues to be generated almost entirely in a small number of large-scale power plants. But those times could soon be over: It is the declared political will at both the national and European level to increase the proportion of power from distributed sources. For by integratUntil now it has been essentially just bothersome for distribution network operators if many small generating units feed power into the system: New lines need to be laid, control gear must be upgraded, power fluxes in the system change. But distributed generation can also deliver benefits.



Electricity is generated almost entirely in a small number of large-scale power plants. But this is set to change.

ing many smaller generating units, energy can be produced more efficiently. One reason is that distributed units often produce not only electricity, but also meet heat needs in their surroundings at the same time.

Yet to make power production more distributed, the distribution network operators will also need to be more active. Their main task in the past has been to operate, maintain and, where appropriate, expand local electricity networks. They can now make the transition from being a mere wheeler of power to an active player at the interface between generation and consumption. This has been made clear by a study produced jointly by the Öko-Institut and the Institute for Future Energy Systems IZES on behalf of seven municipally-owned energy companies.

This is the case, for instance, if "virtual power plants" are created – combinations of several smaller units dispatched centrally. This allows network operators to adjust power production better to the momentary situation in the network: Individual units can be taken on- or off-stream at short notice.

Such active management of systems and generating units costs money, however. "It is thus essential that the regulatory authority rewards network operators for a high proportion of power from distributed sources, for instance by permitting higher network access charges," says Dierk Bauknecht, energy expert at the Öko-Institut. hw

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Green World Cup

The 2006 FIFA World Cup was an absolute success – and not only in sporting terms. Its "Green Goal" environmental action plan also gets top marks in the now published Legacy Report. Of a total of 16 environmental targets, all ambitious, 13 were achieved. For instance, across the average of all



games and cities hosting the World Cup, 57 percent of spectators used local public transport services to reach and return from the stadiums. Overall, three in four spectators used environmentally sound means of transport to arrive.

Results were excellent in the other issue areas too - water, waste, energy and climate protection. Global climate protection was a particularly important field. A key goal of the World Cup Organizing Committee (OC) and its partners was to make sure that the World Cup remains entirely climate-neutral - within the frame of reference of the host country and thus the scope of influence of the OC. This target, surely the most ambitious one, was achieved by offsetting emissions unavoidable in Germany by setting up three climate mitigation projects in India and South Africa. "This excellent outcome speaks for itself", says Dr. Hartmut Stahl, project leader at the Öko-Institut.

The target of cutting the level of energy consumption in stadiums by at least 20 percent was not attained. On the other hand, the second important target was



Successful Football World Cup: The Green Goal project made sure that the environment won, too.

acheived: In terms of energy source, demand was met entirely by renewables.

As environmental targets had never previously been set for a Football World Cup, the OC commissioned the Öko-Institut to produce an innovative and ambitious environmental action plan. The Institute followed this up by providing in-process consultancy to the World Cup organizers while they implemented the plan. The German Environment Ministry BMU supported the work, the German Environment Foundation DBU provided funding. "We hope that future large-scale sporting events take the trail blazed by Green Goal," says Stahl. cs/cr

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Efficient hydrogen tanks for automotive applications

Against the backdrop of climate change, rising energy costs and finite fossil resources, hydrogen is viewed as the fuel of the future. Successful pilot projects such as the operation of hydrogen powered buses in Berlin demonstrate that the appropriate technology is already available, at least in prinat a viable weight and at acceptable cost. The StorHy consortium consists of a total of 36 partners, including research/academic institutions, the automotive industry, gas suppliers and EU representatives. The Öko-Institut is involved in a subproject to evaluate the tanks against environ-



Hydrogen can be produced from a variety of sources – including directly from water.

ciple – and experts are predicting that the number of hydrogen powered cars will increase in the next few years. But the greatest environmental benefits of using hydrogen as a fuel are achieved if it is generated from renewables - and there is still a long way to go before appropriate systems will be market-ready. One of the many major challenges is to identify safe, economically viable, "green" hydrogen storage systems for use in automotive applications. The purpose of the integrated project StorHy, which is funded by the 6th EU Framework Programme for Research and Technological Development (FP6), is to develop suitable tanks for hydrogen storage. The project aims to improve the storage of compressed gas, liquid hydrogen and advanced solid materials so that hydrogen powered vehicles can achieve a good range

mental criteria. "From an environmental perspective, our evaluation is unlikely to find any major sticking points with the storage tanks," says Dr. Wolfgang Jenseit, a research chemist at the Öko-Institut. "But the tanks are just one small building block in the entire hydrogen chain. The key issue is whether the system as a whole - from generation to distribution, storage in the vehicle and end use, will yield the environmental benefits that we are looking for. That's impossible to judge at this stage." Jenseit is not anticipating a swift solution to the technical problems - he points out that the energy losses in the initial part of the hydrogen chain are very high, the tanks are still too heavy, and the vehicle range is very low. kk

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17 –

What would life be like if the ads heroes left us cold?

Robert, George and Jennifer – the three pillars of sustainability?

The other day in the "Speisezimmer", a restaurant run by Sarah Wiener: "Just imagine, I got mail from Robert Redford personally. He's lobbying to save sensitive forests and prevent drilling for oil in sensitive regions like the Arctic!" The co-member of Generation 20 Plus shrugs her shoulders and pokes around in her carrot cocktail.

Second try: "How did you find the great poster with Pierce Brosnan on the FSC label¹ for sustainable forest management?" Your companion at the table - by profession an expert on consumer information and sustainability labelling - looks up: "When was that?" The attractive former 007 was to be admired last year for, after all, a full six months and all across Germany on outdoor advertising pillars – admittedly, a medium now 150 years old - on which he announced "You don't need to be a secret agent to protect our forests" and "Words are not enough"...

Third try: "There was a long article in the last Vanity Fair on the way Hollywood celebrities are promoting sustainable lifestyles. I found George Clooney pretty good." At last, eyes shine and a long sigh goes round – including among the female representatives of Generation 30 Plus Plus: "Ah, George really does look great. Were you at the Berlin film festival?" Dreamy stirring,



Celebs doing good? Let's do it ourselves!

the carrot cocktail is almost finished: "What's his cause?"

The lunchbreak round breaks up, telephone conferences and appointments beckon. "By the way, we could take greater care at the office to buy sustainable products such as fair trade coffee, I'll talk about it to the others today", says a colleague. A good way to go, and natural enough? Unfortunately not.

The sustainability debate has been focussing for years upon the great importance of prominent role models, so-called promoters, for changing people's lifestyles. But what impact can really be generated that way? What would life be like if everyone viewed themselves as a model for sustainable products in their own circle: Requesting organic produce in the company canteen and praising the canteen management for the tasty vegetable dish, making more use of local public transport and taking one's nice neighbour along, asking for FSC-certified wood at the DIY store and explaining the benefits to the store's management? Being a competent sustainability agent could catch on - and could be fun! Hand on heart, dear critical consumer: What do we need Robert, George and Jennifer for? In Germany alone, we have 80 million consumers who could be ambassadors for a new lifestyle. Revolutionary or illusory? Surely whatever age we are we can have a sustainable dream, and the secret agent whispers over and again: "Words are not enough!"...

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Protection Division at the Öko-Institut's Darmstadt Office. The social scientist has been with the institute since 1984, working on, among other things, sustainable consumption, risk communication and energy policy, and the public communication of these issues.

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New in the Web Photos and documents resulting from the Öko-Institut's **Annual Conference** on 22 and 23 September in Berlin are now available for download free of charge. At www.oeko.de/jahrestagung users will find all the presentations made by speakers, a selection of images and the proceedings of the individual panels.



A new website now presents the **Öko-Institut in the "Solar Ship".** Go to www.oekoinstitut-im-sonnenschiff.de to check out the building's energy strategy and its special ecological features. *cr*

info: www.oeko.de/062/discovering

Reading resource Elixir or bone of contention?

Reading resource Less people, less worry?

For a long time, population growth was considered the main threat to the environment. It is now becoming clear, though, that a shrinking population does not automatically reduce environmental impact. "Unterm Strich" (the bottom line), published by Volker Hauff and Günther Bachmann and containing contributions from the Ecologic Institute and the Berlin Institute for Population and Development, casts the spotlight on the various impacts of demographic change on society.

In the past, the sustainability debate has mainly re-



volved around ecological and also economic and social issues. This book now puts demographic development at the centre of analysis. An aging population, declining numbers of children, outward and inward migration are factors influencing all realms of human life. Through the prism of an "inter-generational assessment", the authors cast new light on the op-

portunities, problems and challenges arising in the fields of human settlements, employment and income, education, inward migration, natural heritage, energy and mobility.

They also propose a number of integrative approaches by which to curb traffic volume. For regions with declining populations, for instance, they suggest that schools combine several grades in single classes, and integrate social and municipal services at the same time. They further suggest that more people might work at home in future in order to reduce commuter traffic; this, however, is questionable from a social perspective. A good read overall. dw

Günther Bachmann & Volker Hauff (eds.): Unterm Strich. Erbschaften und Erblasten für das Deutschland von morgen. Eine Generationenbilanz (The bottom line. Demographic change and the future of Germany. An inter-generational assessment), oekom Verlag, Munich 2006, 128 pages, 14.80 Euro. ISBN 3865810411. Nothing goes without electricity. Management consultant Beate Kummer and former Economics Minister of the German state of North-Rhine/Westphalia Ernst



Schwanhold have assembled numerous energy bosses and policy experts in their book to debate the issues surrounding sustainable energy policy.

The focus is on how to shape an overall strategy. Many of the authors use the volume to argue the case for their specific energy source: They support its claim to sustainability with a mixture of scientific numbers, ideological-

ecological visions and arguments that are difficult to assess, at least for the non-expert.

Thus, overall, the principal use of this book will be to get a clear idea of the positions adopted by the various stakeholders in future debates on sustainable energy policy. dw

Beate Kummer & Ernst Schwanhold (eds.): Nachhaltige Energiepolitik. Herausforderungen der Zukunft. Versorgungssicherheit Umweltverträglichkeit Wirtschaftlichkeit (Sustainable energy policy. Challenges for the future. Security of supply – environmental performance – cost-effectiveness), Honnefer Verlagsgesellschaft, Bad Honnef 2006, 431 pages, 34.80 Euro. ISBN 3-9810935-0-X.

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If, as a member of the Öko-Institut, you waive your right to receive the printed version of eco@work and opt to receive only the electronic version instead, we will be pleased to set up a free six-months subscription for you to the "Natur & Kosmos" magazine (6 issues; in German). This offer remains valid until March 2007. To make use of it, please cancel your subscription to the printed version of eco@work by mailing or faxing Markus Werz, Member Service. Mr Werz will be glad to answer any further questions you may have. m.werz@oeko.de, phone: +49(0)761/45295-29, Fax: +49(0)761/45295-88. dw

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Resource conflicts?

Cable rolls from building sites, manhole lids, steel railings and even railway tracks: Now that resource prices are mounting all around, theft of metals is on the rise. The media have even reported armed robberies.

Which scenarios might then be conceivable once states and economies compete more fiercely in the future over resources? Take note: This will be in a setting in which newly industrializing economies are booming and the world population is continuing to grow.

The next eco@work will give resources a closer look, casting the harsh spotlight of science on the new scarcity debate. The urgent ecological questions and economic and social aspects of resource use will not escape attention either. Look out for the next issue in spring 2007.