

eco@work

Sustainable reading from the Öko-Institut

Getting moving on climate protection

Sustainable
transport
strategies

The interview:
Michael Sailer,
new Öko-Institut CEO

Dear Readers,

The international climate conference in Copenhagen showed that there is a lot to be done if we are to succeed in curbing climate change. The transport sector is particularly important in this context, since it is the largest producer of greenhouse gases outside the energy industry and is responsible for one-fifth of worldwide CO₂ emissions.

At the Öko-Institut we are therefore particularly pleased that recent surveys reflect a new, more climate-friendly attitude to transport and mobility among consumers.

Seventy percent of those interviewed in these surveys think that the motor industry is still not doing enough to offer models that are economical and climate-friendly. Forty percent plan to buy a car with lower fuel consumption in future, 35 percent intend to cycle more and 30 percent say they will leave the car at home more often.

The change in awareness is particularly evident among young people: only 31 percent of 18 to 24-year-olds travel by car every day – a marked drop since the previous surveys. More than half of those questioned in this

age group said that they travel mainly by bus and rail.

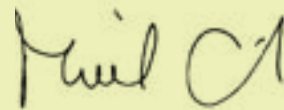
Consumers, it seems, have now got the message that tackling climate change begins at home and that we need to rethink our travel and mobility habits. But what is being done by those who control transport policy? Do car manufacturers and members of parliament take the interests of consumers seriously?

In politics and industry there are signs of hope. For example, at the IAA motor show new, low-fuel cars and electric vehicles were again on display. And instruments such as the EU CO₂ emission limits for cars are a step in the right direction. But if we are to achieve our climate targets it is not enough to confine the discussion to the subject of cars. Other strategies such as greater use of rail transport and the promotion of cycling and walking for local journeys must also be considered.

Transport is an issue that raises many questions on which people need facts and information. Electric cars or expansion of the

public transport system? A CO₂ tax on cars or promotion of biofuels? What is the best solution? One thing is clear – there is no silver bullet for reducing emissions from the transport sector. If transport in Germany is to become more sustainable and more environmentally friendly, we must tackle the issue on many fronts. A whole package of measures is needed if we are to find a way out of the blind alley down which rising CO₂ emissions have led us. In this issue of eco@work we set out some of our ideas on the subject.

Happy reading!



Michael Sailer
CEO, Öko-Institut

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You can read the interview with Michael Sailer on page 3.

Contents

EDITORIAL	2
VALUES	3
„We can curb climate change“ The interview: Michael Sailer, Öko-Institut CEO	
KNOWLEDGE	
A roadmap to solve the transport dilemma	4
Renewability study by the Öko-Institut shows that Germany could cut at least a quarter of its transport-related CO ₂ emissions by 2030	
A way out of the carbon dead-end	8
Öko-Institut report quantifies the climate benefit of public transport: each passenger can save 2.5 kg CO ₂ per journey	

Imprint

eco@work – February 2010, Published by: Öko-Institut e.V.

Edited by: Christiane Rathmann (cr), Katja Kukatz (kk), David Siebert (ds)

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Design/Layout: Tobias Binnig, www.gestalter.de

Technical implementation: Markus Werz

Printed on 100 percent recycled paper

Address of editorial office: P.O. Box 50 02 40,
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Account Details for Donations: Sparkasse Freiburg -
Nördlicher Breisgau

Bank Code No.: 680 501 01, Account No.: 2 063 447

IBAN: DE 96 6805 0101 0002 0634 47, BIC: FRSPDE66

Donations are tax-deductible for German income tax purposes.

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The interview: Michael Sailer, Öko-Institut CEO

„We can curb climate change“

The Öko-Institut has a new CEO: Michael Sailer. As a member of the executive board the 56-year-old has been involved in the Institute's management for the last ten years. He talked to eco@work about his new role and the challenge of climate change.

Mr Sailer, the Copenhagen climate summit did not produce the results that environmentalists wanted. Can climate change still be curbed?

You put it in the right words. Climate change is already under way and all we can do now is limit it. Whether we succeed depends of course to a large extent on international negotiations. We must join forces at global level and reduce CO₂ emissions through renewable energies and energy savings. As a basically optimistic person I believe that we can do it. And we at the Öko-Institut will contribute our knowledge.

Do you dare make an environmental prediction for Germany in 2010?

Globalization only appears to have changed the influence that countries can exert. Germany's particular task is to continue functioning as a model for sustainable development in Europe. I assume that the new German government will grasp this opportunity. The Öko-Institut therefore continues to strive to use its scientific expertise to influence the political framework for sustainability at national and international level.

Is your international involvement increasing?

Yes, it is. For many years we have been doing an increasing amount of work at international level on integrated environmental and social standards and advising on multi-national and bilateral agreements. Our cooperation with international organizations such as UNEP will become even more important, as will our work with international civil society bodies such as the Global Reporting Initiative (GRI) and projects in newly industrializing and developing countries.

What issues are currently on your agenda?

We are working on many fronts to make the future more sustainable. We are developers

and advisers in the fields of climate change mitigation, sustainable production, sustainable resource management and technical safety. Increasingly important activities, alongside environmental and sustainability research, are strategic policy advice and the constructive mediation of divergent interests.

Can you give some examples?

I should like to pick out two of our current topics as examples. This year in the „Klimawende 2050“ [climate transformation 2050] project we are thinking about how we can map out a climate-friendly society with a successfully transformed energy system. We shall continue to develop our international reputation in the field of sustainable resource efficiency and shall set up a flagship project in this area.

You are a qualified nuclear expert. Will the focus of the Öko-Institut change under your leadership?

The nuclear experts at the Öko-Institut have a great deal of specialist knowledge and are familiar with the political context. They word their messages clearly, but discriminatingly. These principles are fundamental at the Öko-Institut and of course also apply to the other subject areas. For more than 30 years the Öko-Institut has given advance warning of environmental crises and problems and has developed solutions. This will not change, especially in this climate century.

The economic crisis is not yet over; business all over the world are still struggling with its effects. Do you notice the consequences at the Öko-Institut?

Fortunately we haven't so far been affected. There are two fundamentals on which we build: economically we remain in good shape, and politically we are and shall remain independent. We shall therefore continue to work with everyone with whom we can help to improve sustainability – that is,


with people and organizations of very varying backgrounds. But our most important asset is our skilled and committed staff.

Where is the Öko-Institut going in the next ten years?

We see ourselves as a think tank; with many of our ideas we are often ahead of the times. In 2020 we shall therefore still be playing a leading role in environmental research and in advising on a sustainable society at national and international level.

Thank you for your time!

The interviewer was Christiane Rathmann.

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Michael Sailer has worked at the Darmstadt office of the Öko-Institut for 29 years. His specialisms have included reactor safety, nuclear waste management, nanotechnology and conflict management. A qualified technical chemist, he has been a member since 1999 of the Reactor Safety Commission (RSK) of the Federal Environment Ministry, since 2005 of the Euratom Scientific and Technical Committee and since June 2008 of the Nuclear Waste Management Commission (ESK – Entsorgungskommission).

A roadmap to solve the transport dilemma



Renewability study by the Öko-Institut shows that Germany could cut at least a quarter of its transport-related CO₂ emissions by 2030



Transport policy is caught in a dilemma: passenger and freight transport is surging in volume as a result of globalization and technological progress – and at the same time harmful CO₂ emissions are rising at a seemingly unstoppable rate. The European Environment Agency sounded the alarm in its 2009 annual report, pointing out that CO₂ emissions from transport – including shipping and aviation – have risen by 36 percent since 1990. For the transport sector this means that the EU climate target of reducing greenhouse gas emissions by 20 percent by 2020 is a long way from being met. Industry, households and energy producers are managing to reduce their emissions – but transport-related CO₂ emissions are rising steadily.

How are we in Germany going to be able to ensure a high level of mobility for everyone without exacerbating the problem of global warming? This was the question addressed by the Renewbility project, which was conducted by a research consortium managed by the Öko-Institut. A distinguishing feature of Renewbility was the involvement of stakeholders from industry and society. „During the two-year research study we organized twelve meetings with representatives of the automobile, rail, energy and logistics sectors and environmental and consumer organizations“, explains Dr. Wiebke Zimmer of the Öko-Institut. „This type of cooperation between scientists and experts working on the ground has never been seen before.“

The price of mobility

The worldwide trend towards greater mobility continues unabated: the number of cars in the world is forecast to rise from the current level of one billion to three billion by 2050. Studies show that in the EU alone freight transport is likely to almost double by 2030; the number of internal flights in the EU has already risen by 120 percent between 1992 and 2008. Yet the transport sector is the largest emitter of CO₂ outside the energy industry, accounting for one-fifth of worldwide CO₂ emissions and one-third of energy consumption.

The study's remit was to look at Germany's whole transport network – from road and rail to inland waterways and internal aviation. A baseline scenario described transport development in accordance with the forecast of the Federal Transport Ministry, which sees passenger travel increasing by 16 percent by 2030. „The main problem is freight transport – industrial and consumer trends are set to drive this up by 91 percent“, says Dr. Zimmer. „Furthermore, despite a slight shift to rail and inland waterways, road haulage will remain the primary means of transport.“ The scientists then investigated what quantity of CO₂ emissions will be saved by 2030 as a result of the transport measures that have so far been implemented or announced. While emissions can be reduced – especially by improving vehicle efficiency and increasing the proportion of biofuels – they found that, because of increasing mobility, overall emissions in 2030 will be at the same level as in 2005. „This is not good enough if Germany is to meet its climate targets“, says Dr. Zimmer emphatically.

Renewability's stakeholder scenario shows how even more CO₂ emissions could be saved in the transport sector. Working with the society-based stakeholders, the scientists have drawn up proposals that are regarded by all concerned as feasible and viable. The discussions involved partners as diverse as the German automobile club ADAC, Friends of the Earth Germany BUND, oil companies, energy providers, logistics companies, German railways, the automobile industry association and the environmental transport organization Verkehrsclub Deutschland. The proposed measures include the expansion of public transport, increased use of electric vehicles, a tightening of the CO₂ emission limit for cars to 80 grams per kilometre in 2030, higher HGV tolls and higher fuel prices.



These steps could reduce CO₂ emissions from 226 million tonnes to 174 million tonnes by 2030 – for the same transport development as in the baseline scenario.

However, the stakeholder scenario shows that any proposed panacea must be viewed with caution. „We must consider knock-on effects“, emphasises Dr. Wiebke Zimmer. „For example, more efficient vehicles make driving cheaper. People then use their cars more, while public transport becomes less attractive.“ In the scenario this undesirable effect has been counteracted by raising fuel prices to around 2.50 per litre. In addition, evaluation of the potential for a shift from private to public transport revealed that regional factors play a major role (see the article on p. 12). „Our modelling shows that in major urban conurbations such as Berlin and Hamburg, the public transport network is already very well developed. In these areas the maximum shift to public transport is already close to being achieved.

In less densely urbanized areas such as Braunschweig, by contrast, there is still work to be done. In these places further expansion of the public transport network would get more people out of their own cars“, is the scientist's conclusion. „One can also reverse the argument – measures such as higher fuel taxes are only effective if an attractive public transport option is available as an alternative“

Being wary of knock-on effects.

Freight transport remains greatest concern .


In the stakeholder scenario the strong growth in freight transport remains one of the greatest problems. However, the scenario shows how the rise in emissions from freight transport in 2030 can be reduced from 20 million tonnes per year to eleven million. Raising HGV tolls would shift some freight transport to rail and inland waterways; in addition, improvements in logistics and telematics could increase the capacity utilization of freight transport.

The study shows that achieving a high proportion of renewable energy in the transport sector needs to go hand-in-hand with a significant reduction in final energy consumption. However, biofuels are only an option if they meet strict sustainability criteria and are produced predominantly from biogenic wastes and residues. Furthermore, imported biofuels must come from degraded land, to avoid competing with land required for food production. The study also

shows that the proportion of electric cars can be increased to ten percent by 2030; these cars should be fully powered by electricity from additional renewable energies. The additional energy needed, amounting to ten terawatt hours, is only slightly more than the amount that the country is likely to be able to produce from sun, wind etc. in 2030, according to the reference scenario of the Federal Environment Ministry.

The verdict of the Renewability study: „We can make mobility more sustainable“ is the opinion of Öko-Institut expert Dr. Zimmer, „but only if politics and industry are prepared to take bold action.“

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Transport and climate protection targets 2020

This is still much to be done in the transport sector if the German government's target of reducing greenhouse gases by 40 percent by 2020 is to be met. Steps that go beyond those outlined in the stakeholder scenario could include: reducing the distance and volume of freight transport, imposing a kerosene tax on aviation and increasing the promotion of cycling as a mode of transport.

The Renewability project's newly developed research strategy provides a reliable instrument that can be used to develop more extensive measures and test their reduction potential.

Electrifying the transport sector – the alternative?

Alternative propulsion systems are one option for increasing vehicle efficiency, reducing dependence on fossil fuels and cutting greenhouse gas emissions. In the light of this, electric vehicles are of particular interest. There are two main types: plug-in hybrid vehicles and battery powered electric vehicles that operate entirely on electricity. Car manufacturers and energy companies worldwide are stepping up their activities in connection with the development of electric vehicles and the batteries and charging stations that they require. But there is also criticism: environmental organizations warn that electric cars could be misused as „green overcoats“ – and, they say, if the electric car is powered by electricity from coal or nuclear power, its green credentials are a sham.

„Electric transport by itself is not a silver bullet“, says Florian Hacker of the Öko-Institut, „but it can make an important contribution to more sustainable mobility.“ The benefits are obvious: electric cars need no

fossil fuels, they are significantly quieter and more energy-efficient than conventional vehicles and they emit no airborne pollutants in use. „But there are still many challenges facing the development of electric vehicles“, stresses the scientist. Because of high battery costs and low battery capacities their range is limited and additional costs are high. In addition, a vehicle battery needs to be charged for several hours; widespread use of electric vehicles depends on there being an extensive network of charging stations. The question of whether users will be prepared to accept such vehicles has not yet been explored in detail, but it has an important bearing on market prospects.

There has been little research either into the environmental balance of electric vehicles. It is clear that they have a significant advantage over conventional vehicles only if they use electricity from low-emission, renewable sources. It should also be borne in mind that growth in electrical vehicle

use will bring about marked changes in the demand for raw materials – especially in the demand for certain metals used in batteries and electric motors – and pose new challenges for vehicle recycling.

The Öko-Institut is carrying out a number of studies of the potential of electric transport for mitigating climate change and reducing environmental impacts in general. For example, the Öko-Institut has been commissioned by the Federal Environment Ministry to consider the potential environmental benefits of electric transport with particular emphasis on interactions between the transport and energy sectors. Researchers are also studying the use of electric vehicles in business fleets in order to shed light on the possibilities of such vehicles, acceptance by users and environmental impacts. The Öko-Institut is also a partner in a major consortium project on battery recycling.



A way out of the carbon dead-end

Report quantifies the climate benefit of public transport

The example of Schleswig-Holstein: A report by the Öko-Institut quantifies the climate benefit of bus and rail. Each passenger journey can save 2.5 kilograms of CO₂. This means that public local transport saves around 255,000 tonnes of CO₂ per year that would otherwise be released into the atmosphere. In the long term, though, better services are needed to secure this environmental benefit.

Bruno Meyer commutes to work daily by train – from Neumünster to Hamburg central station. He can relax during the morning journey, reading the newspaper or enjoy the view of the Schleswig-Holstein countryside. Meanwhile Andrea Müller is in her car on the A24 near Hamburg. The traffic comes to a standstill. She looks at the clock nervously. Has she allowed enough time for the daily drive from Büchen to Hamburg? Wouldn't it be nicer to arrive at work without having to put up with stress and traffic fumes on the way?

„Each time someone takes the train instead of travelling by car they not only spare their

nerves, they also save around 2.5 kilograms of carbon dioxide“, says Martin Schmied, a staff researcher at the Öko-Institut, commenting on the above fictitious example. „That may not sound very much“, says the sustainable mobility expert, „but it is more than the average amount of CO₂ – about two kilograms – that each of us causes every day as a result of using electricity at home.“ So tackling climate change is not just a global issue.

Public transport gives the climate a break.

Everyone can help to combat global warming, for example by being environmentally aware on transport matters and leaving the car at home from time to time.

„ÖPNV und Klimaschutz in Schleswig-Holstein“ [Public transport and climate protection in Schleswig-Holstein] is the title of a study conducted by the Öko-Institut for LVS Schleswig-Holstein Landesweite Verkehrsservicegesellschaft mbH. The report shows that public transport is already making an important contribution to tackling climate change and will continue to do so.

In the report Martin Schmied and Stefan Seum, staff researchers at the Öko-Institut, compare the nationwide carbon dioxide emissions of local road and rail transport with those of car traffic in Schleswig-Holstein. The figures used relate to 2005 and to forecasts for 2012 and 2025. From the climate angle the journeys by public local transport have a clear advantage. Local rail passenger transport in Schleswig-Holstein saves around 105,000 tonnes of CO₂ per year. In addition, local bus travel saves around 150,000 tonnes of CO₂ per year. By

comparison with car travel, therefore, buses, trams and trains cut CO₂ emissions in the state by 255,000 tonnes. This is roughly equivalent to the carbon dioxide emitted annually by a town the size of Flensburg (population 90,000) as a result of heating and electricity use. According to the study, car traffic emits around four million tonnes of CO₂ per year in the state. This means that without the public local transport system, transport-induced emissions in Schleswig-Holstein would be 6.4 percent higher.

To calculate possible savings by 2025, the researchers considered two possible scenarios for the transport company's services. The forward projection scenario covers only those service improvements that are already planned. The proactive scenario, by contrast, takes account of the impact of improved services and additional infrastructure investment. „If the current situation is projected forwards, the climate advantage of public transport falls by 2025“, says Martin Schmied. That is because the specific CO₂ emissions of cars will fall faster – as a result of improvements in vehicle efficiency – than those of trams and trains. „Through a proactive service policy, however, the climate advantage of rail passenger transport can be developed – even though population numbers, and in particular the number of schoolchildren, are falling and at the same time the proportion of more economical cars is rising“, he explains. Possible improvements include increasing the frequency of trains on popular routes to every 30 minutes. This could involve using shorter trains hauled by a light power car rather than a heavy locomotive, thereby reducing overall CO₂ emissions.

Better capacity utilization – greater environmental benefit.

The general rule is that the higher the capacity utilization of local transport, the greater the climate benefit. „This means that it is essential to improve services in order to increase the existing average capacity utili-

zation of 20 percent“, says Martin Schmied. It is particularly important to address the situation outside the rush hour. While capacity utilization is already high at the peak times for travelling to and from work, many buses, trams and trains are relatively empty outside these times. Transport companies could, for example, increase capacity utilization by offering cheaper tariffs for off-peak journeys: „If more passengers choose to use trams and trains outside the rush hour, this requires no additional trains and hence causes no additional CO₂ emissions.

Thus each new passenger who exchanges a journey by car for one by public transport after 9 o'clock in the morning is directly benefiting the climate“, says the Öko-Institut scientist. If use of public transport in this way increases by one percentage point, this reduces the environmental burden by 2,300 tonnes of CO₂ annually.

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Car, bus or train?

Öko-Institut involved in regional analysis of the study „Mobility in Germany“

Individual car traffic in Germany is stagnant or even declining slightly; at the same time the Germans are walking more or making greater use of buses and trains. While senior citizens are becoming more mobile and are driving more often, young adults in the major conurbations are more frequently leaving the car at home and using public transport instead. These are some of the surprising findings of „Mobility in Germany“ – the most important study of travel behaviour yet conducted in Germany. The study was carried out by the Institute for Applied Social Sciences (infas) and the Institute for Transport Research at the German Aerospace Centre (DLR) on behalf of the Federal Transport Ministry.

More than 100,000 individuals from 50,000 households were questioned for the study in 2008; between them they re-

ported on more than 300,000 journeys. The data collected provides a basis both for transport planning and for a wide range of studies of everyday travel.

The Öko-Institut, working closely with infas, will now carry out the environmental analysis of the regional samples that were used to supplement the basic survey. The work will involve comparing the regional results with the national average, evaluating them and using them to identify climate protection measures for the transport sector. In addition, infas and the Öko-Institut offer special environmental analyses of the travel survey for local authorities and other interested parties.

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