2016 dialogue forums
No energy for the turnaround?

Positions

Munich Re Foundation
From Knowledge to Action

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Nuclear power out, wind and sun in – that is the essence of Germany's energy transition. Solar thermal energy, wind farms, electromobility and energy efficiency are well-known buzzwords. But the devil is in the detail. Germany is at odds over power transmission lines, feed-in tariffs, financing the nuclear phase-out, and lots more besides. Is it possible to restructure the energy sector – in Germany and around the world? We discussed this and many other topics with experts and our audiences on the five evenings of our 2016 dialogue forums, including what we as individuals can do to make the energy transition a reality.

The following articles constitute a summary of the most important findings. Germany is certainly heading in the right direction, but its showcase project, the energy transition, is under threat. The winds of environmental change are fading fast – and are being overshadowed by other national and international issues. The Federal Government must limit the costs – without strangling the green revolution – and yet keep pushing in the right direction. It must work with business, academia, civil society, and each and every one of us. We cannot allow ourselves to be deterred by gaps in financing, disputes or endless political discussions. The energy transition has to succeed. The 2016 dialogue forums have shown how we can do it.

We hope you enjoy reading this publication.

Thomas Loster
Munich Re Foundation

Energy-saving champion and yet not masterly

Germany is the world champion in energy efficiency! At least that's what the American Council for an Energy Efficient Economy (ACEEE) says. However, this is no reason to rest on its laurels. We are a long way from achieving the German government's goal of reducing primary energy consumption by 20 %, compared to 2008, by the year 2020. Without improved energy efficiency – and that also includes efficient infrastructure – the energy turnaround will remain incomplete, Stephan Kohler feels sure: "It has already become difficult at this point to integrate additional wind and solar electricity capacities into the power grid. The further expansion of photovoltaic and wind power stations is therefore counterproductive if we do not optimise the existing systems."

In order to achieve the goals enshrined in the National Action Plan on Energy Efficiency, business, policymakers and consumers must pull together. The motto is: reduce energy consumption and make energy use more efficient. Here it is not just a question of technical modifications in industry, trade or private households. Rather, completely new business models and products must be created which allow German business to score points on world markets. For example, the "National Top Runner Initiative" encourages manufacturers of efficient domestic appliances to get their products onto the market faster and so increase their market penetration.

Kohler sees shortcomings among policymakers who, for example, have not managed to approve a tax break for the energy-efficient refurbishment of buildings. "I wonder then who can still take the politicians seriously if they cannot even succeed in implementing such a simple tool." The German government has not been totally inactive, however. Over the next five years alone, € 17 bn will go into its programmes promoting greater energy efficiency.

The transport sector holds great potential, but many players are still reluctant to take a proper crack at it. "This is one of the most difficult topics of all", admitted Thorsten Herdan, Director-General for "Energy Policy: Heat and Efficiency" at the Federal Ministry for Economic Affairs and Energy. One possibility would be to set the automotive companies an upper CO_2 limit for their fleet consumption or to tax company cars more heavily. There is still a lot to do if we want to achieve our climate protection goals. Energy efficiency is a quite decisive factor.

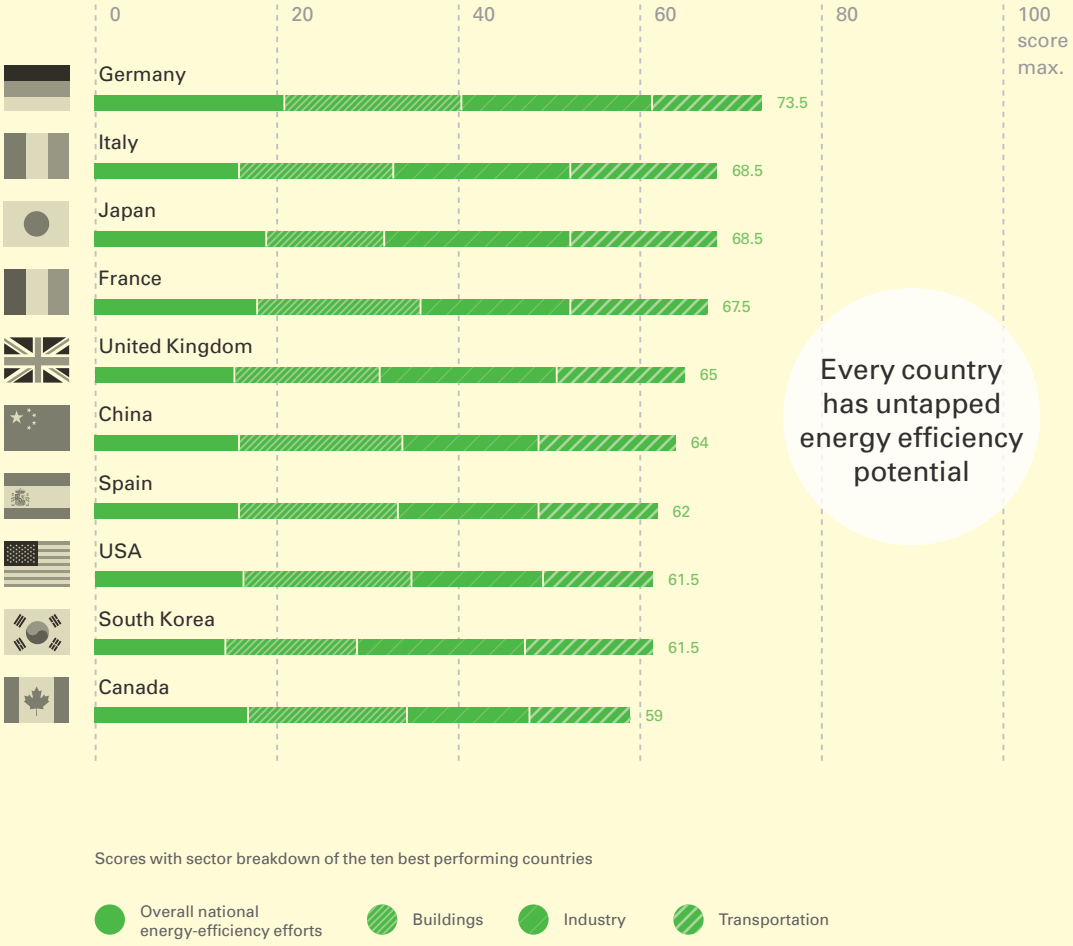
"Germany is the world champion in energy efficiency. But we are still far from performing masterly."

Stephan Kohler
Chairman of the Advisory Board
of power supplier GETEC

"National Action Plan on Energy Efficiency — will Germany be the energy world champion?"
12 April 2016

International energy efficiency rating

The American Council for an Energy-Efficient Economy has rated the 23 world's most energy-hungry countries using a points system. A maximum score of 100 points could be awarded in the four categories of industry, buildings, transportation and overall national energy-efficiency efforts. Germany claimed the top spot in the rankings with a score of 73 out of 100.



Source: American Council for an Energy-Efficient Economy

Boost for Germany as a place to do business

The changeover to renewable energies for power generation certainly comes at a price. But just worrying about the cost is not the right approach. Jürgen Karl from the Friedrich-Alexander University, Erlangen-Nuremberg, recommends focusing discussions more on the economic benefits and positive effects of the energy turnaround. "For the economy as a whole, the energy turnaround is paying off", he emphasised. Many countries had already followed Germany's example and would increasingly be focusing on renewable energy sources. "China has installed wind power plants with a capacity of 150 gigawatts, more than twice as much as we have." German companies like Siemens are benefiting enormously from the export of technology. The positive second-round effects, which often far exceed the costs, are rarely mentioned in the media, however, and are not always fully appreciated by the public.

"If we want to keep our prosperity, Germany must maintain its leading position as a place for engineers", warned Franzjosef Schafhausen from the Ministry for the Environment. New technologies like „power to gas" or the construction of power storage units should be promoted politically, in order to close the power gap on days with little wind or sun. But not everyone sees it this way: "If possible, the solution should be found on the market, because power to gas is simply too expensive," countered Peter Franke, Vice-President of the Federal Network Agency. Head of E.ON Germany, Ingo Luge, however, is hoping for a breakthrough in storage technology: „As with solar modules, battery prices will fall dramatically over the next few years, creating the basis for a new mass phenomenon," he predicted. One positive side-effect of the expansion of new technologies is the creation of numerous jobs.

Germany must ensure that it is not left behind by the competition from Asia, as it was with solar panels. Most of the research into efficient energy storage devices already takes place in Asia. In addition, what role Germany will play in e-mobility also remains open. The National Platform for Electric Mobility, instituted by the German government, is endeavouring to take the lead. Taking pole position as the leading market is essential, if only for reasons of credibility: "We cannot claim outside the country to be offering the best products if things are not working out inside the country", says Henning Kagermann, President of the German Academy of Science and Engineering (acatech). If Germany succeeds in becoming leading provider and leading market, electromobility could create up to 30,000 new jobs.

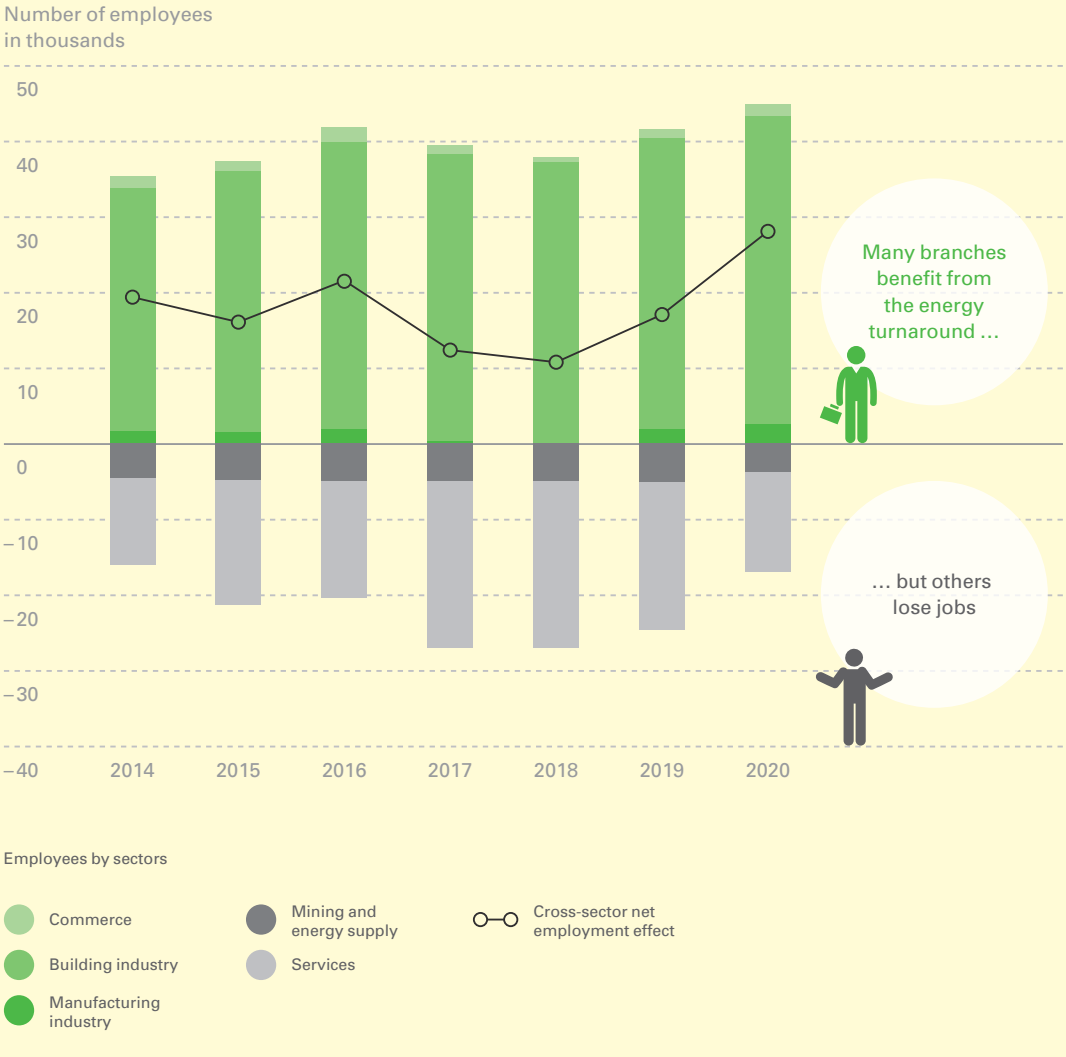
"The energy turnaround has so far created 390,000 jobs in Germany."

Prof. Jürgen Karl
Friedrich-Alexander University,
Erlangen-Nuremberg

"Energy turnaround – who will pay the bill?"
16 February 2016

The energy transition is creating jobs

The ecological restructuring of our energy system is having a positive effect on growth and employment. The economic stimuli generated by renewable energy expansion and measures for greater energy efficiency outweigh the negative employment effects in the conventional energy sector and related branches of industry. Positive employment effects are also expected in the coming years.



Source: DIW Econ GmbH

Still too much CO_2

The changeover to a more sustainable supply of energy has been initiated, thanks to the advance of wind and solar power. But why has this not so far been reflected in falling CO_2 emissions? On the one hand, the power sector uses only a small proportion of fossil fuels (see also Position 4). On the other hand, according to Johannes Kempmann, the policymakers have created the wrong framework conditions. "One problem with the energy turnaround is that we aren't able to consume all the electricity produced from wind and solar power in peak periods, so we then transfer the surplus to the European neighbours," explained the President of the German Association of Energy and Water Industries. Although there is a grid development plan for the federal states outlining possibilities for the transport of wind power from the north of the Republic to the rest of the country, Bavaria has pulled out of the project, so the urgently required investments are a long time coming.

In addition the falling prices of coal and of emissions certificates as part of emissions trading are making it cheaper to generate power that pollutes. Coal-fired power plants are thus able to produce electricity more cheaply than the environmentally-friendlier gas-fired plants. More dirty coal has to be burnt when the sun and wind fail to deliver sufficient power.

In order to achieve the decarbonisation of energy production, a better plan is needed with particular milestones specifying by when which power plants had to be shut down, Kempmann urged. "Policymakers call the tune, but it is then the suppliers who have to make out the bill and take the abuse. That is unworkable in the long term", he made it clear.

Furthermore, emissions trading is not currently working, because of the oversupply of CO_2 certificates. If emissions are to be reduced, a reform is urgently required. "Although discussions are being conducted, they are failing at European level due to the different interests. EU-wide consensus on precisely this issue would be important", explained Kirsten Westphal, energy expert at the German Institute for International and Security Affairs (SWP). And time is running out as climate change inexorably ploughs ahead: globally, 2015 was by far the warmest year ever recorded, and heat records are advancing.

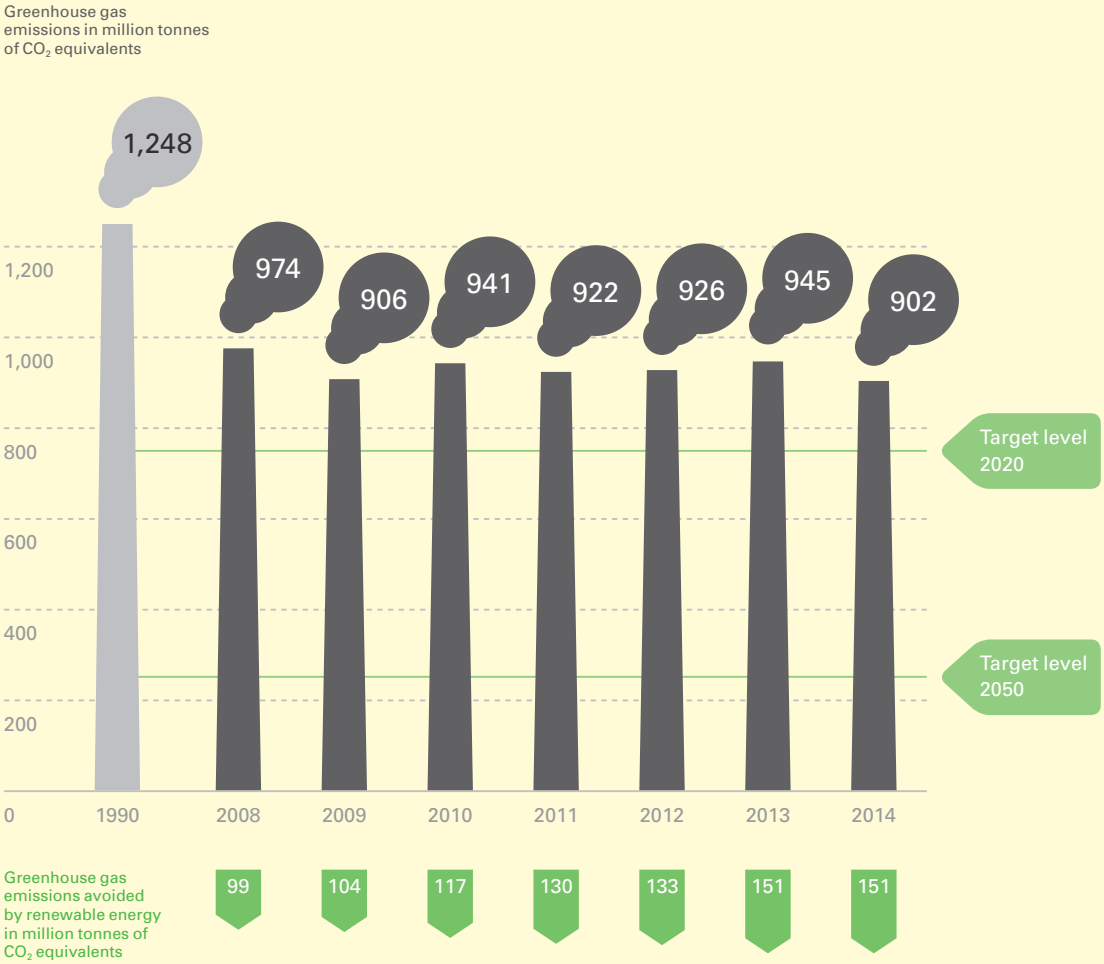
"Renewable energies are gaining ground — but CO_2 emissions are barely falling."

Johannes Kempmann
President of the German Association of Energy and Water Industries (BDEW)

"Energy turnaround the only alternative – right on track with sun, wind and water"
21 January 2016

Stagnation despite reduction

The use of renewable energies avoided about 150 million tonnes of CO_2 emissions in Germany in 2014. That is 50 per cent more than in 2009. Nevertheless, the total emissions volume for CO_2 equivalents has stagnated at over 900 million tonnes per year. A great deal more effort will be required to reach the target of 740 million tonnes by 2020.



Source: German Federal Ministry for Economic Affairs and Energy, and UBA (Umweltbundesamt)

Electricity isn't everything

In the German economy, the heating and transport sector accounts for two-thirds of the primary energy used. According to Kirsten Westphal, for heating and on the roads too, there is no alternative to the energy turnaround if dependence on fossil fuels is to be reduced. The energy expert at the German Institute for International and Security Affairs is concerned that oil, gas and coal will continue to dominate in the coming decades: "If we look at the year 2050 with its population of nine billion, it becomes clear that our current energy path is neither sustainable, nor can it guarantee supply reliability."

Munich City Utilities (SWM) wants to lead by example. Not only are the electricity requirements of Munich to be covered by renewable energy; by 2040, its entire district heating network is also to be powered by green energy. "This will largely take place in the form of geothermal energy", explained SWM's CEO, Florian Bieberbach. SWM is also exploring new avenues for air-conditioning buildings, as Lisa Frieg, also from SWM, explained: "In the summer, surfers in Munich cool off in the Eisbach river. In future, we will utilise the city's streams to air-condition houses and offices in an environmentally friendly way."

It would help if buildings were better insulated. But tax incentives are absent, because the federal states fear tax losses of a billion euros. Yet 80 % of the buildings in Germany fail to meet the energy requirements of the Energy Saving Ordinance (EnEV).

"Policymakers change direction like a flag in the wind, with decisions lasting only until the next election. Future-oriented investment is not possible under these circumstances", criticised Johannes Kempmann, President of the German Association of Energy and Water Industries.

Gerd Lottsiepen of the Ecological Transport Club of Germany (VCD) explained why there is no way round electromobility: "If we are serious about the energy turnaround, individual transport must be decarbonised by 2050." With the current state of the art, this can best be achieved with battery-powered vehicles, provided the electricity they use comes from renewables. Policymakers, the automotive industry and car buyers must invest and, in doing so, work together towards the same goal.

"We must focus particularly on heat generation, industry and transport."

Dr. Kirsten Westphal
Energy expert at the
German Institute for International
and Security Affairs (SWP)

"Energy turnaround the only alternative — right on track with sun, wind and water"
21 January 2016

No energy turnaround without a heating turnaround

Whereas the energy turnaround usually focuses on transport and the generation of electricity, the heating sector receives relatively little attention. Wrongly so, as heating for buildings, at over 1,300 terawatt-hours per year, accounts for more than half of the entire volume of energy consumed in Germany. Heating systems with a higher efficiency rate as well as better building insulation are important. However, it is actually the conscious behaviour of the citizens, which saves heating energy above all.

Overall consumption in Germany
2,553 TWh

24 %
Electricity
609 TWh

24 %
Fuel
616 TWh

52 %
Heating energy
1,328 TWh

1 terawatt = 1,000 billion watt

Source: AG Energiebilanzen e.V.

Combustion engine on its way out

The German government has set itself the ambitious goal of having one million electric vehicles on the roads by 2020. So far, however, e-mobility has been confined to the shadows, and the automotive industry is facing its greatest challenge ever: "We will be seeing new competitors and mobility concepts that are currently unknown, along with the emergence of new companies dealing with battery technology and e-mobility", prophesied BMW Manager, Ulrich Kranz.

"E-mobility will arrive in force between 2020 and 2030", Hennig Kagermann was convinced, and went on to explain that the future will bring cars which are not only powered by electricity but are also networked and drive autonomously. Networking will lead to new business models: "Providing mobility as a service is different from selling a car", pointed out the President of the German Academy of Science and Engineering. And our society is increasingly moving towards services.

The National Platform for Electric Mobility, over which Kagermann presides, wants to position Germany as the leading e-mobility provider. With the multi-billion investments made by companies and the state, German industry is well on its way to achieving this goal. However, the number of vehicles licensed so far lies far below expectations, and there are currently only around 50,000 electric vehicles on Germany's roads. It remains to be seen whether the buyer's premium approved by the federal government will boost sales. As yet, there is no indication that it will.

Gerd Lottsiepen would have preferred a different arrangement: "If a buyer's premium must be offered, then it should be based on a merit-demerit system", urged the spokesman for the Ecological Transport Club of Germany (VCD). The buyer's premium could be financed by imposing a financial levy on drivers whose mode of travel is not climate-friendly, while at the same time branding gas guzzlers as harmful. Lottsiepen also advocated the introduction of ambitious CO_2 emission thresholds for car makers' fleets and called for a speed limit because: "If electric cars try to keep pace with today's speeds on the motorways, the batteries will run down very quickly," he said.

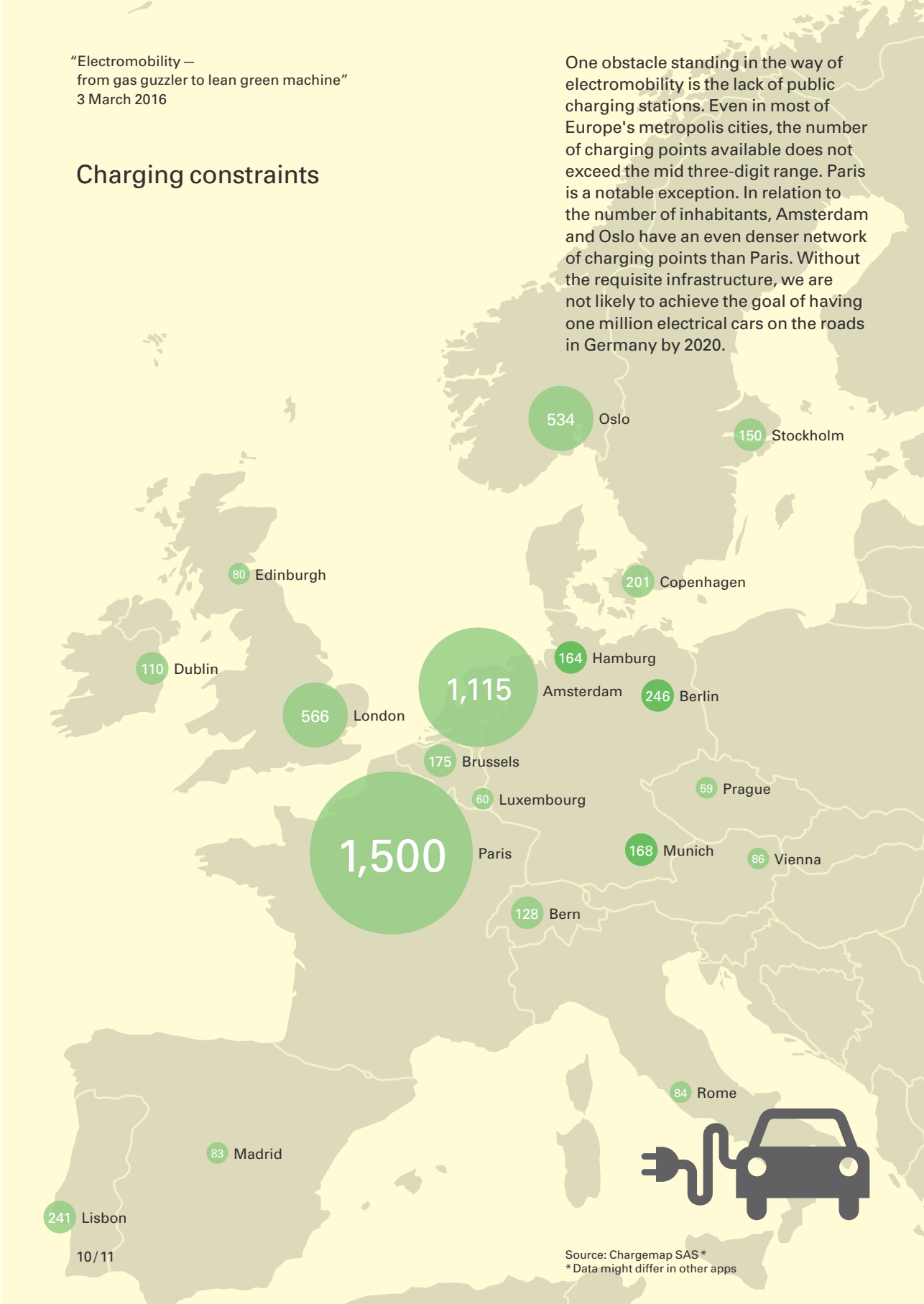
The necessary charging-station infrastructure continues to be almost completely absent in Germany. "Town councils would therefore have to play along, as they do in Norway, for example. And if electric cars are to achieve real market potential, batteries have to come down in price. There's no way round that."

"The future on the roads will be electric, networked and autonomous."

Prof. Henning Kagermann
President of the German Academy
of Science and Engineering (acatech)

Charging constraints

One obstacle standing in the way of electromobility is the lack of public charging stations. Even in most of Europe's metropolis cities, the number of charging points available does not exceed the mid three-digit range. Paris is a notable exception. In relation to the number of inhabitants, Amsterdam and Oslo have an even denser network of charging points than Paris. Without the requisite infrastructure, we are not likely to achieve the goal of having one million electrical cars on the roads in Germany by 2020.



Source: Chargemap SAS *
* Data might differ in other apps

Cheaper than expected — the energy turnaround

The purchase prices of electricity have been falling on the stock market for years, but consumers barely benefit from this. On the contrary: household electricity bills are constantly rising, and private customers have to pay almost 30 cents per kilowatt hour – the second-highest electricity prices in Europe, after Denmark. There is no relief in sight either, as falling purchase prices on the stock market are offset by increases in state-regulated charges like the Renewable Energy Sources Act (EEG) levy and network charges. The question of who will pay the cost of the energy turnaround was easy to answer. Peter Franke from the regulatory authority, the Federal Network Agency, got right to the heart of the matter: "All of us who buy electricity," he explained. However, the apportionment varies enormously according to region and customer. Leading industrial customers, for example, are exempt from the EEG levy used to subsidise the feed-in of solar and wind power.

Sebastian Sladek thinks the criticism of the energy turnaround is unjustified: "A lot of things are mixed into the discussion", the Managing Director of the utility company Schönau (EWS) explained, citing the expansion of the grid as an example. This was now due in any case, as investment in expanding the grid had been neglected in recent decades. Now, however, the cost was being blamed only on the energy turnaround. "Anyone who says the energy turnaround is too expensive should not forget that coal and nuclear have received, and indeed still receive, a lot of money from government coffers", he pointed out. Sladek therefore called for true-cost pricing on the producer market, as renewables could then match nuclear and coal-fired power any time.

"The energy turnaround is no more expensive than the alternatives would have been", agreed Jürgen Karl of the Friedrich-Alexander University, Erlangen-Nuremberg. Even before the energy turnaround, electricity prices had continuously increased. He said that this was often forgotten in the public debate. "If the generation of green electricity had not been expanded, the price of electricity on the stock market would not have fallen over the last few years, but would instead be twice as high as it is today", the Professor explained. "In the final analysis, however, even with the EEG levy we are not paying any more than we would have to fork out for conventional electricity generation alone." The benefits of the energy turnaround far outweigh the costs.

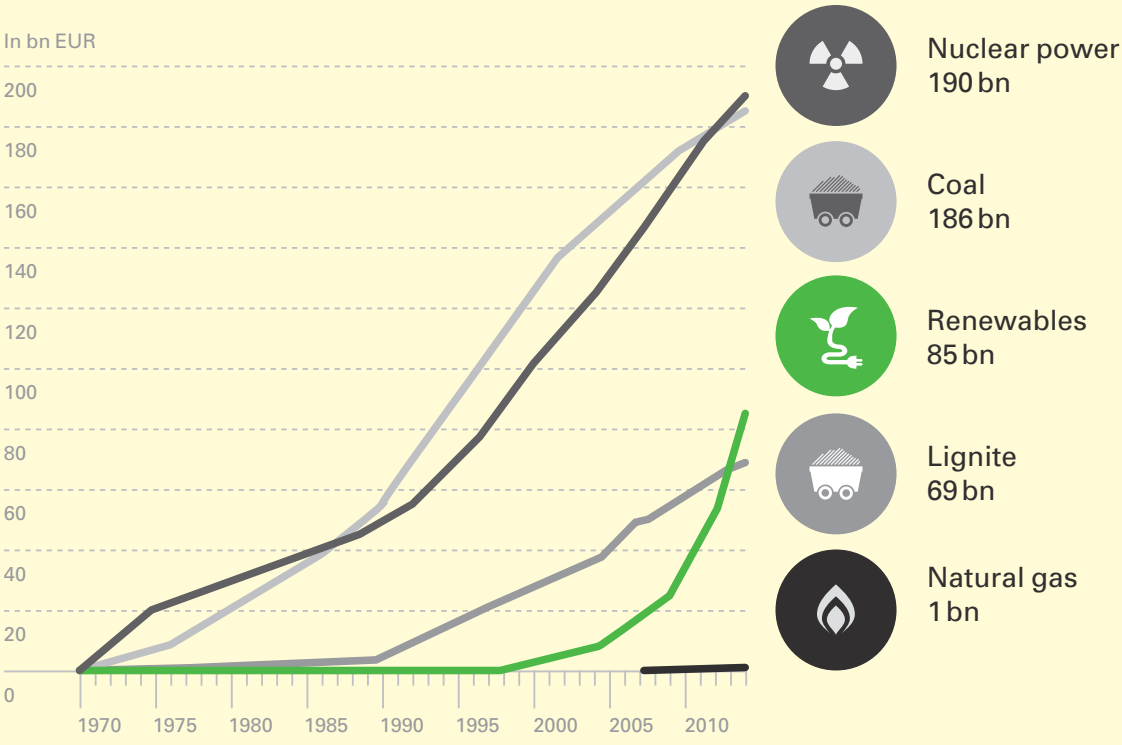
"If there was true-cost pricing on the producer market, renewables could match nuclear and coal-fired power any time."

Sebastian Sladek
Managing Director of the utility company Schönau (EWS)

"Energy turnaround — who will pay the bill?"
16 February 2016

Balancing subsidies

Critics complain that the subsidies for renewable energies have ramped up the prices. However, it should not be forgotten that the conventional energy sources of nuclear power and coal have also benefited substantially from public-sector funding. The difference lies primarily in the fact that the greatest proportion of these costs were not reflected transparently in the electricity prices but were paid by government funding and, therefore, indirectly by the tax payer.



Accumulated government subsidies for electricity generation 1970–2014

Source: Forum Ökologisch-Soziale Marktwirtschaft e.V., Greenpeace Energy eG

Saving is ‘square’? It doesn’t have to be!

Reducing energy consumption without making sacrifices is the basic idea of the National Action Plan on Energy Efficiency. Savings can be made on both the large and the small scale – for example, with the transmission of power. Frank Büchner explained that “with the power transmission lines that today are the norm, transmission losses of roughly 10 % are to be expected. These losses can be reduced by means of high-voltage direct-current (HVDC) transmission technology to a third, or even to twenty-five per cent”, said the head of Division Energy Management at Siemens Germany.

A further 25 % of energy can be saved if production lines are optimised with the help of product lifecycle management, in other words by managing the process, from the concept development stage through construction and production to disposal, as efficiently as possible. “This means 43 million fewer tonnes of CO_2 per year”, the expert spelled out in figures. And, last but not least, an average of 35 % less energy can be used if buildings are not only insulated but also completely refurbished to make them more energy-efficient.

There are many shortcomings in dealing with energy efficiently. “Getting people to do such ordinary things as saving electricity is difficult”, admitted energy consultant Elisabeth Benecke. Creating more transparency and awareness of individual consumption would help – for example, using smart meters that display current consumption in euros and cents. “At the moment, the cost of these devices is too high to make them worthwhile for households”, said Thorsten Herdan from the Federal Ministry for Economic Affairs and Energy, explaining the government’s hesitance on this point. But this is the path that will have to be taken, if only to better harmonise the strongly fluctuating supply of power from renewables with consumption.

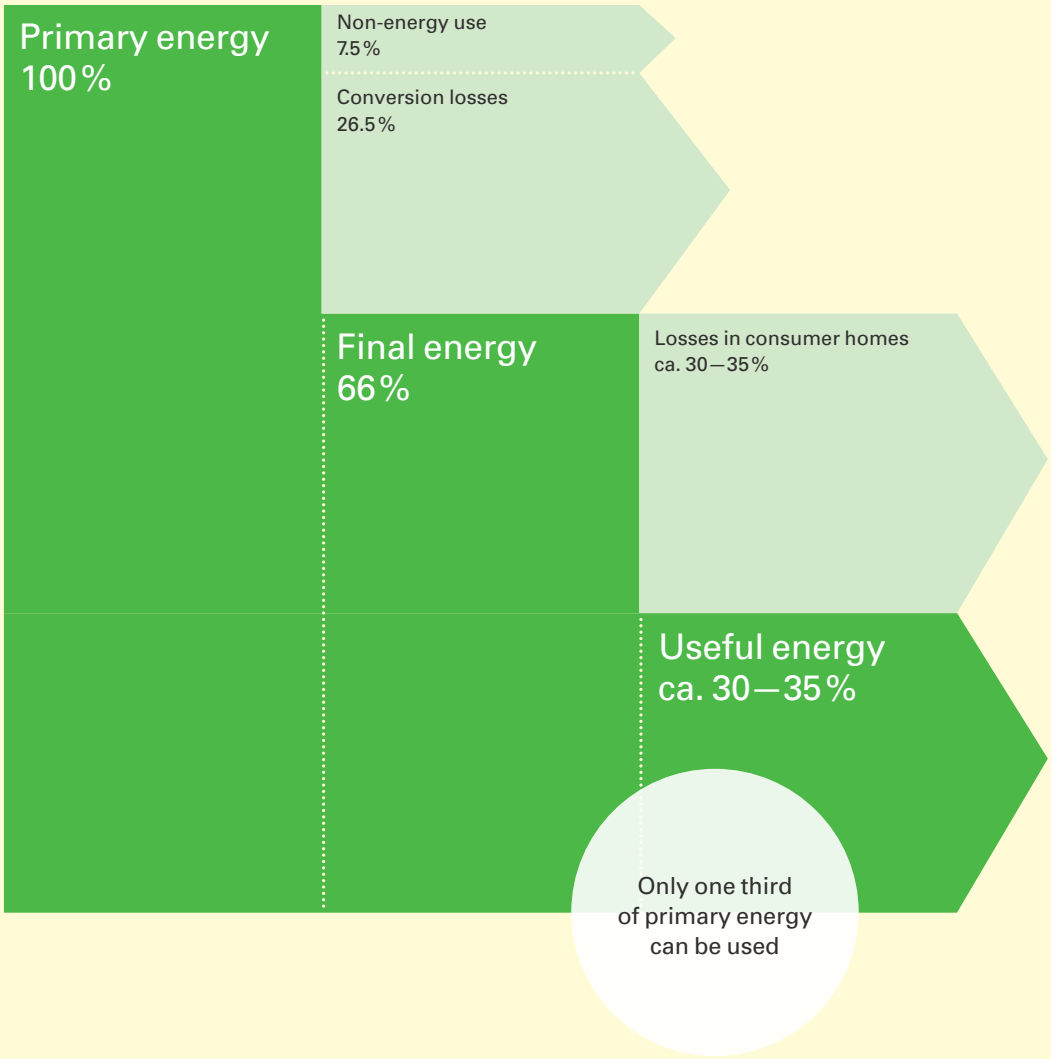
When purchasing electrical appliances, citizens should be sufficiently well informed to be able to decide for themselves whether a new purchase makes sense in both economic and ecological terms. “The eco-balance of replacing a ten year old fridge is clearly positive, even taking into account the grey energy required to produce the new fridge”, Stephan Kohler, Chairman of the Advisory Board of power supplier GETEC, elucidated. In many areas, investments in energy efficiency pay for themselves through the energy costs saved. “Many people are tempted by special offers. But it is also possible to save a great deal of money by using energy efficiently.”

“Energy efficiency is a treasure trove of intelligent solutions for the energy turnaround.”

Dr. Frank Büchner
Head of Energy Management Division,
Siemens Germany

High investments — low yields

Only one third of every unit of primary energy consumed from sources such as coal, gas, nuclear power or renewables is actually used. The rest is lost during the conversion from primary to secondary energy or during transmission and the end use.



Source: AG Energiebilanzen e.V.

Accepting instead of ordering

Franzjosef Schafhausen from the Federal Ministry for the Environment is convinced that the energy turnaround needs three things: time, money and acceptance. But the more concrete projects become, the stronger resistance among the population grows. After all, who wants a 200-metre-high wind turbine or a high-voltage line on their doorstep? "Here, you have to ask yourself what the alternative would be. The argument then mostly becomes very tenuous", Schafhausen points out. It is therefore important to get the consent of the population.

But this proves to be difficult, because backlashes are the order of the day when those affected feel they are poorly understood. "Behind the conflicts there is often resentment about the uneven distribution of costs and benefits, lack of co-determination and insufficient opportunities for involvement", energy consultant Elisabeth Benecke outlined the problems. The citizens' energy forum for the state of Hessen (Bürgerforum Energieland), established by the state government, showed that policymakers can also intervene to provide support. It supports municipalities and citizens with implementing energy-turnaround projects. All the conflicting parties can exchange views on a neutral platform and objectify the debate. In some cases, it has already been possible to jointly work out solutions.

With energy-saving too, the government has recognised how important it is to better focus on information, persuasion and acceptance among the population instead of on regulation. It now spends more than four billion euros each year to fund energy efficiency measures. "No other single area receives as much funding as this one", explained Thorsten Herdan. But financial incentives are not yet effective everywhere: "For many people, saving money on electricity use is apparently not sufficiently motivating", Jakob Assmann, founder and board member of the energy supplier Polarstern, is convinced.

For Peter Franke, Vice-President of the Federal Network Agency, the key to success is participation: "The people affected must be involved more closely in the planning processes, and transparent tendering criteria must be ensured." So far, this has only worked well in the early stage of needs assessment. When it comes to the design of a project and the pylon really is going to be in your own backyard, it soon puts an end to the participation. Then alternatives must be discussed – like underground cabling. Although being more expensive, it can prevent disputes and endless discussions. And it promotes the energy turnaround.

"The key to success is participation."

Peter Franke
Vice-President of the
Federal Network Agency

A "Yes" with limitations

Three quarters of the population think that the energy transition in Germany is basically a good thing. However, it should not cost more than the previous energy system, nor should it entail any personal restrictions. The construction of a power line near to their homes already leads to a drop in acceptance, and only one in five people can come to terms with higher prices.

73 %

basically have a positive attitude towards the energy turnaround

39 %

are willing to approve power lines in their neighbourhood

17 %

would accept higher energy prices

Source: dena, YouGov

Dare to achieve greater sustainability

Acting economically means using available goods efficiently, in order to satisfy human needs in the best way possible. Ecology deals with the interaction between individual living things and with their environment. The energy provider Polarstern is proof that economy and ecology need not be contradictory in the context of the energy turnaround. "We are a company that gives equal weighting to ecological, social and economic returns", co-founder and board member Florian Henle pointed out. Polarstern is going one step further than other green providers by providing electricity produced exclusively from regional German hydropower, and gas generated entirely from organic waste. "We developed the product ourselves and, because none of the power suppliers showed any interest, we marketed it ourselves as well", Henle explained.

Jakob Assmann, another co-founder of Polarstern, sees the energy turnaround as a huge opportunity to restructure and strengthen democratisation of the economic system in the spirit of an economy for the common good. Newly industrialising countries too ought to be included in the process from the outset. "We are currently building biogas units in Cambodia, to prevent the people from burning too much wood." The energy turnaround needs to be implemented all over the world, because Germany won't be able to stop climate change on its own.

The automotive sector too will not be able to avoid more ecology. "The trend towards sustainable mobility is particularly evident among the younger generation", BMW Manager Ulrich Kranz is certain. It is increasingly assuming social responsibility and expects manufacturers not only to produce an environmentally-friendly product but also to ensure that the entire process, from the production of the raw materials to the recycling stage, is based on sustainability. The Group's "BMW i" brand, under which its electromobility activities have been brought together, has responded to this. Now, the goal of sustainability has the same importance as a vehicle's cost or weight.

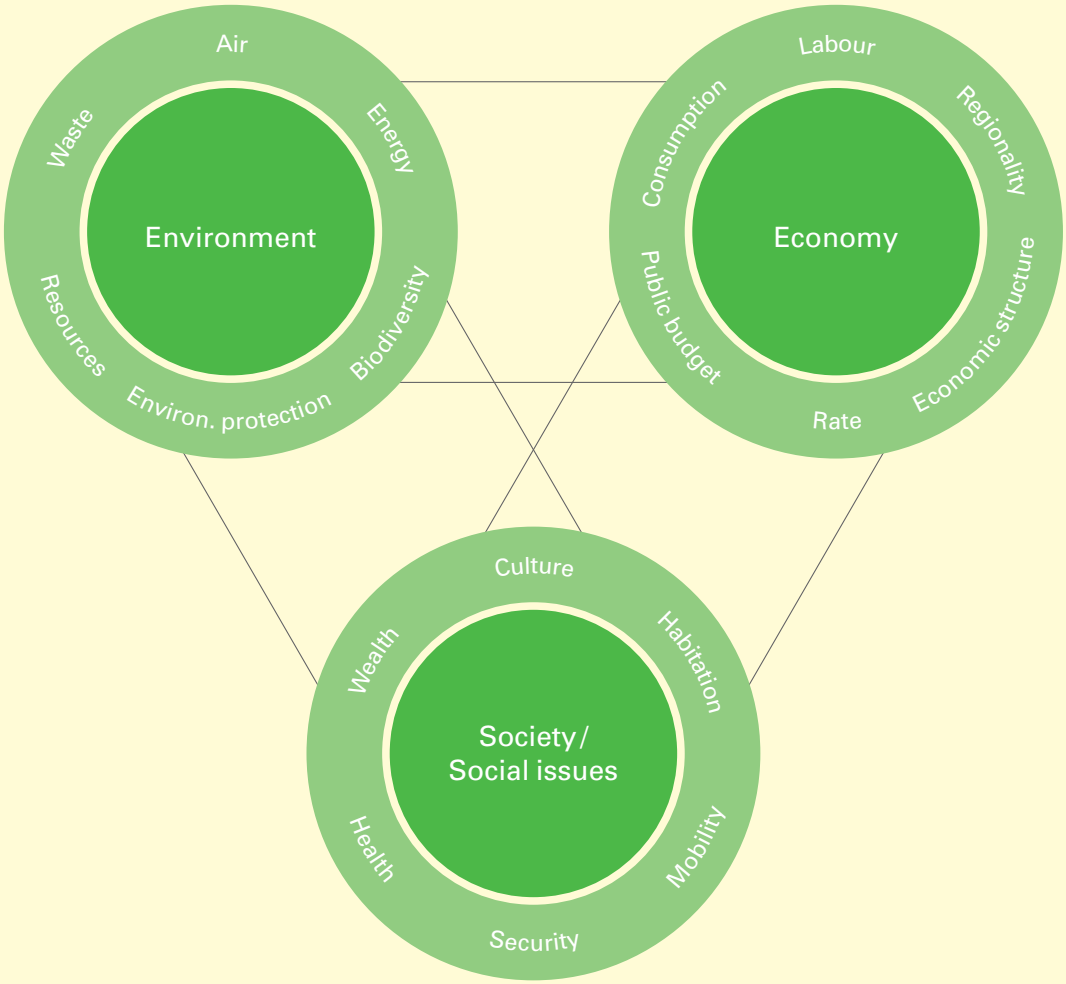
If electromobility is to be used in an environmentally sound way, we have to make sure that the electricity comes from renewable resources. Otherwise, even an electric car is a Trojan horse. "We need to reach a consensus with our neighbours on a sustainable energy supply," explained Kirsten Westphal, energy expert at the German Institute for International and Security Affairs (SWP). This is a major challenge for German energy policy. If we manage to better maintain the European idea again, we will be on the right track.

"An energy supplier can also operate effectively if the ecological, social and economic returns are given equal weighting."

Dr. Florian Henle
Founder and board member of
Polarstern GmbH, Munich

Sustainability aspects

Sustainable development is only possible if the environment, economy and social aspects are considered together as a whole. In each of these three areas, the social players should pursue different goals such as biodiversity, regionality or health. This inevitably leads to target conflicts, as people place different demands on the ecosystem depending on their lifestyle and the way they manage their financial resources.



Source: Dipl.-Ing. Edmund A. Spindler

Creating awareness among young and old

Each of us has the ability to contribute to the success of the energy turnaround. It is a question of attitudes and values, and it is often not even necessary to forgo comfort or make major sacrifices. The conscious use of energy is possible. You just have to want it. All the more important it is, to make children, as tomorrow's climate protectors, aware of the topic as early as possible. For climate-preserving behaviour cannot simply be switched on – it grows.

There is no shortage of programmes for teaching about climate protection in schools and other educational establishments. Through project weeks or experiments, adolescents learn how even just small changes in everyday behaviour, or simple measures like the use of energy-saving light bulbs, can help protect the climate.

For adults wanting to find further information about a more careful approach to energy, advice centres are the first port of call: consumer advice centres, regional energy suppliers or municipal support units. They advise how to avoid wasting energy in daily life and what incentive schemes there are for replacing old electrical appliances or heating systems. The City of Munich is setting a good example here and has its own incentive scheme to support its citizens' efforts to save energy and switch to renewable energy sources. "Although funding has been increased, it's still a tough battle", reported Florian Bieberbach. The CEO of Munich City Utilities (SWM) commented critically that the schemes on offer could possibly be made more citizen-friendly.

Detailed information is also available from the Munich environmental organisation Green City e.V., or nationally from the German Energy Agency (dena). The latter established the EnergyEfficiency+ Initiative expressly for this purpose and finds competent advisers for private households in many towns and municipalities. The fact that three-quarters of the population do not know how they can contribute to the energy turnaround shows just how important such resources are. We therefore need to create the right awareness not only among children and young people. Everyone – including adults – must rethink their position in order for the turnaround to succeed.

"Education on sustainable development is the key to climate-conscious behaviour and should be learned as early as possible."

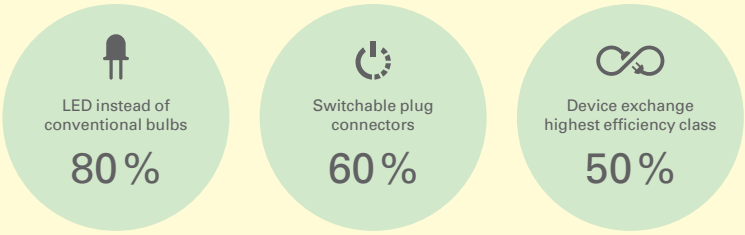
Dr. Elisabeth Benecke
Energy Consultant at genius gmbh

Saving — easier than people think

It is relatively simple to use less heating energy or electricity within your own four walls. The potential for saving lighting energy is substantial if conventional bulbs are replaced with LED bulbs. The standby consumption of many electrical devices – preferably of the highest efficiency class – can be reduced by using switchable plug connectors. This not only makes a perceptible difference to private budgets but also to the environment.

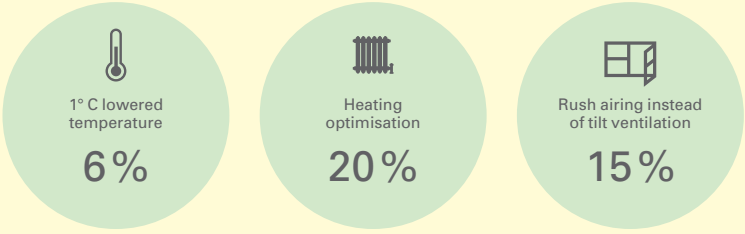
Overall electricity saving potential

Examples



Overall heating energy saving potential

Examples



Source: Energie-Experten

2016 dialogue forums
No energy for the turnaround?

Thursday,
21 January 2016
7 p.m.

Energy turnaround the only alternative — right on track with sun, wind and water

Johannes Kempmann
President of the German Association of Energy and Water Industries (BDEW)

Franzjosef Schafhausen
Head of the department "Climate Policy, European and International Policy", German Federal Ministry for the Environment (BMUB)

Dr. Kirsten Westphal
Energy expert at the German Institute for International and Security Affairs (SWP)

Tuesday,
16 February 2016
7 p.m.

Energy turnaround — who will pay the bill?

Peter Franke
Vice-President of the Federal Network Agency for Electricity

Prof. Jürgen Karl
Friedrich-Alexander-University, Erlangen-Nuremberg

Dr. Ingo Luge
Chairman of the Executive Board, E.O.N. Germany

Sebastian Sladek
Managing Director of Elektrizitätswerke Schönau Vertriebs GmbH

Thursday,
3 March 2016
7 p.m.

Electromobility — from gas guzzler to lean green machine?

Prof. Henning Kagermann
President of the National Academy of Science and Engineering (acatech)

Ulrich Kranz
Head of "Project i" and member of the BMW Supervisory Board

Gerd Lottsiepen
Policy spokesperson for the Ecological Automobile Club Germany (VCD)

Tuesday,
12 April 2016
7 p.m.

National Action Plan on Energy Efficiency — will Germany be the energy world champion?

Dr. Frank Büchner
Head of Energy Management Division, Siemens Germany

Thorsten Herdan
Head of the Department for Energy Policies, Heat and Efficiency of the German Federal Ministry of Economy and Energy

Stephan Kohler
Chairman of the GETEC Advisory Board

Thursday,
12 May 2016
7 p.m.

Do something! — my contribution to the energy turnaround

Dr. Jakob Assmann
CEO of Polarstern GmbH, Munich

Dr. Elisabeth Benecke
Energy Advisor and Consultant, genius gmbh

Dr. Florian Bieberbach
Chairman of the Municipal Utilities services of Munich

Tuesday,
31 May 2016
6 p.m.

Dialogue forum special for students, trainees and pupils: Energy turnaround — Do something!

Lisa Frieg
Municipal Utilities services of Munich

Dr. Florian Henle
CEO Polarstern GmbH, Munich

Carina Wollmann
Productmanager BMW i, BMW AG

Presenters:

Dr. Patrick Illinger
Science Editor, Süddeutsche Zeitung, Munich
(January, February, April, May)

Dirk Reinhard
Vice Chairman, Munich Re Foundation, Munich
(March)

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Christian Barthelt
Munich Re Foundation
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Sources

American Council for an Energy-Efficient Economy (2016): The International Energy Efficiency Scorecard. TinyURL: http://tinyurl.com/d6z6dmj
Page 3

DIW Econ GmbH (2015): Die Beschäftigungseffekte der Energiewende. Eine Expertise für den Bundesverband Wind-Energie e.V. und die Deutsche Messe AG. Berlin. On the basis of BMWi (2014) and GWS, Prognos and EWI (2014)
Page 5

German Federal Ministry for Economic Affairs and Energy (2015): Ein gutes Stück Arbeit. Die Energie der Zukunft. Vierter Monitoring-Bericht zur Energiewende. Berlin. On the basis of Arbeitsgruppe Erneuerbare Energien-Statistik (02/2015). UBA (Umweltbundesamt) (2015): Treibhausgas-Emissionen in Deutschland seit 1990 sowie Ziele für 2008–2012 (Kyoto Protokoll), 2020 und 2050 (Bundesregierung).TinyURL: http://tinyurl.com/jdguq5u On the basis of Umweltbundesamt (2015), Nationale Treibhausgas-Inventare 1990 bis 2014 (01/2016) and Zeitnahprognose (03/2016).
Page 7

Thermondo GmbH, Adler, T. (2014): Blogparade: Definition Wärmewende. TinyURL: http://tinyurl.com/zjfqyvt. On the basis of AG Energiebilanzen e.V. (2011) and BDH/dena (2012).
Page 9

CHARGEMAP SAS (2016): Find a charging point for your electric vehicle. Online at https://de.chargemap.com
Page 11

Forum Ökologisch-Soziale Marktwirtschaft e.V., Greenpeace Energy eG (2015): Was Strom wirklich kostet. Berlin, Hamburg.
Page 13

AG Energiebilanzen e.V. (2016): Energieflussbilder. TinyURL: http://tinyurl.com/hgent9v
Page 15

dena, YouGov (2014): Ergebnisse der Umfrage zur Energiewende und Energieeffizienz. TinyURL: http://tinyurl.com/jqw8po5
Page 17

Spindler, A. E. (2011): Geschichte der Nachhaltigkeit. Vom Werden und Wirken eines beliebten Begriffes. TinyURL: http://tinyurl.com/qdfttll On the basis of Diefenbacher (1997).
Page 19

Energie-Experten (2015): Energiespar-Tipps! Wärme, Strom und Wasser sparen! TinyURL: http://tinyurl.com/h4lal2x
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