Funding renewable energy in an efficient way

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More than 30 per cent of Germany’s electricity now come from renewable sources. In the first half year of 2015, the share of renewables in electricity consumption reached a record high of 32.5 per cent. In ten years time, it is to reach 40 to 45 per cent. Funding renewables is no longer about helping new technologies enter the market, but reaching expansion targets in time and in a way we can afford. Newly installed systems have to be able to hold their ground in the face of competition. The revision of the Renewable Energy Sources Act (German abbreviation: EEG) of 2014 serves as the basis for this. In order to move away from fixed, government-controlled funding rates and towards greater competition, an auction scheme has been set up.

Pilot auctions for solar farms are a first step in this direction. Operators of new ground-mounted solar installations are only entitled to funding under the Renewable Energy Sources Act if they have taken part in a bidding process and their bid is successful. The bidders demanding the lowest funding amount will be given the contract. So the key question is: Who will bid for less?

In other words, funding will go to those who ask for less money. In future, this rule shall also apply to other green technologies. According to current plans, the funding process for renewables is to be changed to an auction scheme by 2017. The main points are laid out in a paper drafted by the Federal Ministry for Economic Affairs and Energy, which is undergoing public consultation. The paper focuses on onshore and offshore wind energy, as well as photovoltaics. These technologies are to contribute most to the expansion targets defined as part of the revised version of the Renewable Energy Sources Act of 2014. More than 80 per cent of the electricity generated by newly installed renewables installations could receive funding as part of the auction scheme. An auction for big offshore wind farms must of course be designed differently than an auction for PV systems on buildings. Consequently, we will hold separate auctions, focusing on each technology individually.

**Plannability, competition, diversity: Main objectives**

The auctions will focus on three objectives: plannability, competition, and diversity. In order to control the increase in new installations, the volume up for auction is fixed. Auctions also promote competition between the operators. The funding awarded to operators will be just enough to cover the cost-efficient operation of the installations. That is the underlying principle of the auction scheme. This is also to the benefit of customers, as it is they who bear the costs for funding renewables under the Renewable Energy Sources Act. At the same time, we want to maintain diversity in the sector. There are many different players, including large companies, co-operatives, farmers, and individual investors. SMEs in particular often prove to be especially innovative.

**Funding reduced for ground-mounted PV installations**

The second round of auctions for PV systems, which ended in September 2015, has also shown that there is real competition for receiving funding. This bodes well for the energy transition. A total of 136 bids – covering a volume of 558 megawatts (MW) – were submitted, with the auction volume of 150 MW oversubscribed more than three times over. Some 33 of the bidders were awarded a contract. The winning bids will receive funding of 8.49 Euro cents for every kilowatt-hour (€ct/kWh) of electricity that is fed into the grid. This is significantly less than the amount of 8.93 €ct/kWh that was granted until 1 September 2015. According to the Federal Network Agency, which is responsible for organising the bidding process, the second round of auctions has shown that “operators that are perhaps seen as less professional are also able to make a competitive offer and win a contract”. 

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Information on which bids were selected, on where new solar farms are to be built, and on the second round of auctions is available online from the Federal Network Agency. Bids for the third round of auctions have to be submitted by 1 December 2015.

**Pay-as-bid versus uniform pricing auctions: How is the level of funding determined?**

During the first round of auctions for ground-mounted PV installations, prices were still determined using the so-called 'pay-as-bid' procedure. Every successful bidder received a contract based on the price specified in their bid. This means that every solar farm received a different amount of funding. Now, in the second and third round of auctions, the 'uniform pricing procedure' is being tested. Here too, bids are ranked according to their price, with the bidders demanding the lowest funding amount then being selected – until the volume up for auction (150 MW during the last auction) has been reached. However, each solar farm receives the same funding amount, which is based on the last successful bid. The same price mechanism is also used on the electricity exchange.

The Federal Network Agency assesses and evaluates the results of the pilot auctions. Based on this, the Federal Ministry for Economic Affairs and Energy will submit an evaluation report to the Bundestag before the end of 2015. The findings of this report can help improve the auction design for funding other forms of renewable energy.

**FURTHER INFORMATION**

[➤ Auctions for funding renewable energy](#)
[➤ Renewable Energy Sources Act 2014](#)
[➤ Fact sheet: Auctions for ground-mounted PV installations](#)
New heating systems are more efficient and come with better labelling

Summer is drawing to a close, and soon we will have to fire up our central heating systems again. On 26 September 2015, a new EU directive on energy labelling and ecodesign requirements for new space heaters and water heaters entered into force. The tried and tested EU efficiency label ensures transparency for consumers.

A colour-coded sticker that helps you make informed decisions. In future, the energy efficiency label will help consumers to quickly assess the environmental performance of a heater, making it easier to compare different technologies and select a modern, energy-efficient product. At the same time, the label also has an impact on producers. If customers decide which product to buy based on the information provided on the label, this can boost competition for the most innovative and efficient products, and increase energy efficiency in Europe.

From 26 September 2015 onwards, displaying the well-known, colourful diagram with categories G to A++ will become mandatory for the following products:

- All space heaters that generate heat for a central heating system, such as gas boilers, heat pumps and combined-heat-and-power units
- All combination heaters that also serve as water heaters
- Water heaters, including flow heaters and boilers
- Labelling requirements will also cover hot water storage tanks with a storage volume of up to 500 litres.

Apart from the colourful bars, the label also provides information on rated output and/or energy consumption per year, as well as noise level (in decibels).
Ecodesign: more efficiency, less noise

Apart from the energy labelling requirements that make energy consumption more transparent, the date 26 September also marks the day the new directive on improved ecodesign will become effective. This directive lays out rules for designing space heaters, water heaters and hot water storage tanks in a way that is environmentally friendly. Ecodesign rules will ensure that, apart from a few exceptions, only efficient condensation boilers enter the European market – boilers where waste heat is not simply lost, but can be recovered. Heat pumps, combined-heat-and-power units, and water heaters will also have to comply with minimum energy efficiency standards. Heat pumps will also have to meet noise level requirements. These requirements will be gradually tightened over time. In September 2018, thresholds for nitrogen oxide emissions will be introduced for space heaters and water heaters.

Energy transition in the heating sector – Small changes, big effect

Some 38.2 million homes in Germany have heating facilities. Consequently, improving the energy efficiency of space heaters and water heaters can make a real difference. The European Commission expects the new ecodesign and energy labelling regulations to help reduce primary energy consumption by 20 per cent by 2020, and contribute 25 per cent to the reductions needed to meet the EU 2020 target. Thanks to the new rules, the energy consumption of space heaters and water heaters is to go down by 25.7 per cent by 2020 compared to the baseline year of 2005.

The new rules are part of the European ‘top runner approach’ for boosting the energy efficiency of products. Ecodesign and energy labelling requirements are to encourage the development of products that are more energy-efficient. Requirements for washing machines, refrigerators, TVs, lighting, and recently vacuum cleaners as well have all been implemented and become well-accepted across the EU. In future, the EU wants to extend minimum energy-efficiency standards to around 50 product groups.

New labels for old boilers from 2016

In addition to the new European rules, the Federal Government has decided to gradually roll out the energy-efficiency label to existing heating systems that are more than 15 years old, starting from 1 January 2016. This means that, in future, the old boiler in your basement will most likely have to carry the energy label, as the average German boiler is 17.6 years old. More than a third of all boilers in Germany are actually more than 20 years old. Heating technicians, chimney sweeps and energy consultants will affix the stickers as part of routine checks of heating boilers. Federal Minister for Economic Affairs and Energy Sigmar Gabriel underlined the importance of the measure for home owners. “By introducing the free energy efficiency label for old boilers, we want to better inform consumers and help them save energy. The label is to make sure that consumers can assess the condition of their old boiler quickly and in a way that is easy to understand,” he said. Informing consumers about the fact that their old basement heating system is consuming huge amounts of energy, might encourage them to think about buying a new and more efficient one, which will drastically reduce their energy bill. A look at the statistics on new heaters shows that not only are people installing boilers that are more efficient, but they also are using different forms of energy than ten years ago (see: direkt finds).
This is how Germans heat their homes

As we can see from the heating systems installed in new homes, the heating market is currently experiencing a dynamic development. In the last few years, heat pumps and district heating systems have been used more and more. The latest statistics from the Working Group on Energy Balances confirm this trend.

Heat pumps and district heating on the rise, oil use declining: the following heat carriers are used to heat new homes in Germany.

The majority of new heating systems installed in Germany use natural gas. Last year, a natural gas boiler was installed in almost one in two newly built homes (49.8%), and a heat pump in around one in five homes (19.9%). The percentage of new homes that use a district heating system is even a little higher (21.5 per cent); around 6 per cent of homes use wood and wood pellets as their primary source of heat. The share of oil-fired boilers installed in new homes has become negligible, reaching only 0.7 per cent in 2014. Ten years ago, the situation was completely different. In 2004, oil-fired boilers were still installed in one in ten new homes (10.7%). However, data on the housing stock shows that their market share has been declining sharply for some time now. Although gas-fired boilers are still used in 26.8 per cent of German homes, their share is down from 34 per cent twenty years ago. As very few oil-fired boilers are installed in new homes, the share of this type of heating system in the housing stock will continue to fall.

While fewer homes are equipped with an oil-fired boiler, the number of heat pumps used has grown fast over the recent past. A heat pump works by extracting heat from the air or the ground to heat...
your home. Basically, it works in the opposite way to a fridge. While heat pumps had a market share of 3 per cent back in 2004, their share in new homes alone increased to 19.8 per cent in 2008. The number of homes using district heating systems has almost tripled over the last decade (2004: 7.3%).

However, it will take some time for this development to really make a difference in the housing stock. There are 38.4 million homes in Germany. In 2014, building permits were issued for around 10,000 homes. When taking into account all existing homes, the share of district heating in 2014 amounted to 13.5 per cent, compared to 1.5 per cent for heat pumps – in spite of the boom experienced by this technology over the past few years. But the type of heating system used is not only changing in newly built homes, but also when homes are modernised. On average, heating boilers in Germany are 17.6 years old (see also: ‘New heating systems are more efficient and come with better labelling’).

**Home owners benefit from funding for new types of heating systems**

Changing the old boiler in your basement usually comes with a high price tag attached, so you are not very likely to do it every few years. However, a change might pay off sooner than you think, as your heating costs will go down. Since 1 August 2015, home owners have been offered even more support when changing to an energy-efficient heating system thanks to KfW’s improved ‘Energy-efficient retrofitting’ scheme. Under this programme, home owners can receive a grant of 10 per cent for investing in a modern, energy-efficient oil-fired or gas condensing boiler. Home owners switching over to renewables and planning to use solar thermal energy, a heat pump or a pellet heating system in their homes can claim additional funding under the Market Incentive Programme launched in April 2015: at least €2,000 for a solar thermal installation, at least €4,000 for a geothermal pump and at least €3,500 for a pellet boiler with a heat storage unit.

**FURTHER INFORMATION**

[🔗 Market Incentive Programme (MAP)]
[🔗 KfW funding programmes]
Federal Network Agency confirms grid development plans for 2014

Against the backdrop of a rising share of renewables in Germany’s energy mix, we need to further expand the electricity grid to ensure a secure electricity supply into the future. On 4 September, the Federal Network Agency, confirmed that 5,800 kilometres of new power cables have to be installed by 2024.

Germany’s regulatory authority, the Federal Network Agency, has checked the 2024 Electricity Grid Development Plan as well as the 2024 Offshore Grid Development Plan. More than half of the 5,800 or so kilometres of new lines provided for in the Grid Development Plan will serve to optimise and reinforce the grid. Some 3,050 kilometres of existing cables will have to be retrofitted and updated so they can meet the ever more demanding requirements. In addition to this, 2,750 kilometres of new power cables are needed. In its Offshore Grid Development Plan, the Federal Network Agency has also confirmed two new power lines connecting offshore wind turbines in the North Sea, and one new power line connecting wind turbines in the Baltic Sea, which are to move the expansion of offshore wind energy forward.

What is a grid development plan?

The grid development plans are drawn up by the transmission system operators. The plans define the measures needed to optimise the grid according to current needs – to reinforce and expand the grid in order to ensure reliable grid operation in the coming years. The Federal Network Agency takes a look at the registered demand for new extra-high voltage lines submitted by the operators, and then confirms the measures that – according to its own assessment – will be necessary in the coming ten years. This assessment already includes all of the conclusions from the broad-based public consultation on the grid development plans, as well as the conclusions from the Federal Cabinet’s Energy Summit of 1 July 2015.
Overall, the Federal Network Agency has confirmed 63 measures to expand the onshore grid, and three power lines connecting offshore wind turbines. This means that, in the last few years, the Federal Network Agency has confirmed more measures than were originally outlined in the grid development plans in order to account for the increasing share of renewables in Germany’s energy mix. However, the Federal Network Agency has not confirmed all of the measures that were submitted by the transmission system operators. This has to do with the fact that, in its review, the Federal Network Agency has taken into account that in 2014, a cap was introduced, limiting offshore wind energy generation to 6.5 gigawatts, as well as a requirement to disconnect offshore generation in case there are peaks in onshore wind energy generation. Both measures help reduce grid expansion requirements.

The Federal Network Agency checks if the measures included in the grid development plans are necessary for the energy sector – in line with legal requirements – taking grid infrastructure into account. The next step is for lawmakers to specify the end points of the power lines to be expanded in the Federal Requirements Plan (legally binding). The exact routing of the lines will be further specified in the future.

FURTHER INFORMATION

[→ Grids and grid expansion]
[→ Federal Network Agency: Grid expansion process]
Offshore wind power in Germany set to triple in 2015

Following last year’s reform of the Renewable Energy Sources Act and the improvements made to the investment and operating framework, the number of offshore wind farms has seen a steep rise. To find out where exactly wind power is being harvested in Germany, please see the Ministry’s interactive maps, which are now available on the website.

In early August, the Butendiek wind farm located 32 km off the German North Sea island of Sylt started to generate electricity and feed it into the German grid. The wind farm consists of 80 new installations with a combined capacity of 288 MW. According to the operator, the level of noise emissions measured during the installation was the lowest ever to be recorded. The installation process was completed in time and on budget. On 2 September 2015, the Global Tech I wind farm also began to operate. This wind farm is made up of 80 installations whose combined capacity is a massive 400 MW. As it is situated further offshore than any other wind farm, the wind farm is expected to be able to operate at full load for around 4,000 hours per year, which is about twice as much as an onshore wind farm could provide. Also inaugurated at the beginning of this month was the Trianel wind farm off the shore of Borkum (capacity of 200 MW), with the opening of the Baltic 2 also to take place in September (288 MW).

Offshore capacity added in 2015: 422 new installations within the first semester

The Butendiek, Trianel, Global Tech I, and Baltic 2 wind farms form part of a wider positive trend reflected in the mid-year statistics published by the Working Group on offshore wind power. The expansion of offshore renewable capacity is progressing well, Another 422 installations with a combined capacity of 1.77 GW were added within the first six months of this year, bringing up Germany’s total offshore capacity in the North Sea and the Baltic Sea to 2.78 GW. This figure is
equivalent to the electricity needs of around 3 million households.

The sector is expecting additional offshore capacity to become available in the second semester of 2015. In its latest report on the maritime economy, the German Government projects the total offshore capacity being operated in German territorial waters in the North Sea and the Baltic Sea to reach 3.3 GW by the end of this year – enough to feed in 12 terawatt hours of electricity into the grid. This would mean a threefold increase in Germany’s offshore wind power capacity within just a year. It would also mean that half of the 6.5 GW target of offshore capacity being operated has already been met.

New information services at erneuerbare-energien.de

For a good overview of existing offshore wind farms, projects that are in the planning and construction phases, and grid links, please consult the information pages of the Federal Ministry for Economic Affairs and Energy at www.erneuerbare-energien.de (in German only). You will find each of the existing wind farms, all of the projects that have been approved, and the ones under construction marked on a map showing their exact location. Click on the project to see its main operational indicators. Click here to access the interactive maps.

Renewable Energy Export Initiative at the HUSUM Wind fair

Not only is offshore wind power a vital pillar of our energy transition, it is also a key sector for economic growth, not least for Germany’s coastal regions. The plans for an expansion of offshore wind power in Germany, but also in other countries bordering the North Sea or the Baltic Sea, such as the UK, Denmark, and the Netherlands, have opened up new economic prospects for German manufacturers of wind-powered installations and their suppliers, for the shipbuilding industry, maritime service, and for other sectors as well.

FURTHER INFORMATION

[⇒ Renewable energy
[⇒ Interactive maps showing offshore wind farms (in German only)]
‘Public dialogue on grids’ picking up speed

This autumn, there will be a whole host of events taking place under the umbrella of the ‘public dialogue on grids’, with six citizens’ conferences taking place this month alone. The public are invited to use this opportunity to discuss key issues related to grid expansion. Furthermore, the mobile Citizens’ Bureau will come to many German city centres, and there will also be a number of opportunities to chat with experts online.

All up and down the country, an ever greater number of renewable-energy installations are being connected to the grid. New transmission lines are needed to ensure that the electricity generated by these installations can be used where it is needed. Most importantly, the electricity generated from wind power installations in the north and the east of the country needs to be transmitted all the way to the south. This is why grid expansion is absolutely vital if we want our energy transition to be a success.

As part of the planning process, all of interests at stake must be heard and weighed up against each other. The ‘public dialogue on grids’, an initiative funded by the Federal Ministry for Economic Affairs and Energy, is a platform that allows everybody affected by the expansion to be involved in this process. Since it was launched in May 2015, it has proven its worth as a neutral point of contact providing practical advice and a wide range of services.

Close to the people: Citizens’ conferences

The half-day conferences that will be taking place in the German cities of Erlangen (21 September), Kassel (22 September), Hanover (24 September), and Magdeburg (30 September) will provide an opportunity for the public to debate important aspects of grid expansion, including costs, alternatives, and acceptance of the projects by the public.
Close to the people: Citizens’ Bureaus

There are regular surgeries being held at the Citizens’ Bureaus that have been opened in the regions which, under the current plans, will be affected by the “electricity highways”. So far, this is true for Quakenbrück (in the district of Osnabrück), Erfurt, and Fulda, where these Bureaus have made it possible for the public, the local authorities, and for companies to have local contacts they can get in touch with for information on grid projects, planning procedure, and the technologies that will be used, and any repercussions they might have. Furthermore, the Bureaus organise public dialogue events. More Citizens’ Bureaus are set to be opened over the coming weeks and months.

Close to the people: the mobile Citizens’ Bureau

The mobile Citizens’ Bureau is pictured above making an appearance in front of the Federal Ministry for Economic Affairs and Energy on the occasion of the German Government’s open day in late August. Its purpose is to provide the information services offered as part of the public dialogue on grids to people living in regions that do not have their own Citizens’ Bureau. Anyone interested in the expansion of the grid, individual steps of the procedure, or ways in which the public can get involved can turn to staff for this information.

Searching projects by postcode

There is a lot of talk about ‘electricity highways’ and routes and many people wonder whether these will affect their own region as well. A new search tool, which can be found at www.buergerdialog-stromnetz.de (in German only) helps answer this question: users can simply enter their postcode and will be directed to a list of all of the potential projects in the vicinity. This includes all of many projects for which, so far, only the starting and end points are known (such as with Suedlink), with the routes having yet to be determined.

Expert chats

Ask your question and receive an answer in real-time: that is the idea behind the online dialogue or expert chats, of which the first was held on 4 September 2015. The dates for the next few events – also to be held this month – have yet to be fixed.

Furthermore, the public can use the website of the public dialogue to ask their questions 24/7. All questions will be answered by email within three working days.
Minister Gabriel on new draft legislation "Parents are held liable for their children"

Who is to be held liable for the costs of decommissioning and dismantling nuclear power plants? This is the question at the heart of the draft legislation for an 'Act on liability for the dismantling and of nuclear power plants and their disposal'. In the first week of September, the Federal Ministry for Economic Affairs and Energy launched the consultation process with the Länder and the relevant associations.

Germany wants to phase out nuclear energy by 2022. There is a clear set of rules when it comes to who must bear the cost of nuclear decommissioning and nuclear-waste management. Under applicable law, this responsibility falls solely to the operators of the nuclear power plants in question. They must bear all of the costs of decommissioning and dismantling their nuclear power plants and of disposing of all of the radioactive waste.

The new rules that have been put in place are there to ensure that the large energy corporations affected by this will actually assume these liabilities in the long term – even where they undergo restructuring. As Federal Ministry for Economic Affairs and Energy Sigmar Gabriel put it in no uncertain terms, the rules are based on the principle that "parents are held liable for their children".

Once the consultations with the Länder and the associations have been concluded, the Federal Cabinet is to deliberate the text.
New solar cells set efficiency record

The HELENE research project funded by the Federal Ministry for Economic Affairs and Energy has been a real success. The enhanced 'PERC' solar cell can convert 21.7 per cent of the sunlight absorbed into electricity. We explain why taking the lead in international competition also helps boost the German solar industry.

The Federal Ministry for Economic Affairs and Energy and the Federal Ministry of Education and Research have launched a joint research programme called 'R&D for photovoltaics'. Now, the first global record has been set. Solar cells developed as part of the HELENE research project have reached 21.7 per cent efficiency, setting a world record for p-type mono-crystalline PERC solar cells. These cells convert more than one fifth of the solar energy absorbed into electric energy. Solar cells of this type currently available on the market do not exceed 18 per cent efficiency. The project is being run by seven partners, and coordinated by SolarWorld Innovations GmbH. The Federal Ministry for Economic Affairs and Energy has awarded funding of just under ten million euros to the project.

What is special about this project is that the solar cell was not developed in a research lab, but as part of an industrial research and production process. This means that the industry will be able to quickly adopt this level of quality.

The new solar cell uses the so-called PERC technology. PERC stands for 'passivated emitter and rear cell'. Compared to the cells of the previous generation, the enhanced solar cells come with an improved rear side that can absorb even more sunlight. PERC technology is about to be launched onto the markets nationwide. Producers are already adapting their production processes to take into account the new developments. This gives the German solar industry a competitive edge in international competition.

High efficiency ratios help to further reduce the cost of solar electricity. As part of the HELENE project, solar cell efficiency is to be further increased to 22.5 per cent.
‘Solar electricity research’ programmes drive competitiveness

The Federal Ministry for Economic Affairs and Energy is granting funding of 43 million euros to nine industry research projects under its ‘R&D for photovoltaics’ programme, also called ‘solar electricity research’ programme. Success stories like the new efficiency record that was set show that research programmes make German photovoltaics research and production more competitive. In order for Germany’s energy transition to be successful, research and development activities are necessary to further build on new technologies and innovations.

FURTHER INFORMATION

Quote of the week

Half of Germany’s energy consumption comes from heating. However, most of the boilers in Germany are outdated. So transforming our energy system in Germany means changing our boilers at home. People interested in heating their homes in a particularly efficient way, can use the efficiency label for new heaters, which is to be introduced on 26 September, as a guideline. Heat pumps extract energy from the environment or the ground. They are highly efficient and therefore a good choice for consumers.

Karl-Heinz Stawiarski, CEO of the German Heat Pumps Association (BWP).
Figures on energy efficiency in 2014 show Germany is on the right track

The figures for 2014 published by the Working Group on Energy Balances show that private households, industry, and producers of power have all made major headway on energy efficiency. Private households were the most successful, improving their energy performance by close to 6 per cent (further information in German only).

Webinar on the Energiewende on 7 October, 11 a.m. CET

Patrick Graichen, director of Agora Energiewende think tank, will be giving a webinar about the current status of Germany’s energy transition (Energiewende), focusing on important lessons-learned and forthcoming challenges. There will also be a Q&A session. The webinar will take place on Wednesday, 7 October 2015 from 11:00 a.m. to 12:00 noon CET. To participate, please register here. The webinar is free of charge.

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