Energy Cooperatives

Citizens, communities and local economy in good company
Friedrich Wilhelm Raiffeisen Energie eG

Sun for everyone
Getting together to realise large-scale energy projects

“What’s impossible for the individual can be achieved by many.” This cooperative principle from the nineteenth century neatly sums up the approach taken by the people managing the Friedrich Wilhelm Raiffeisen Energie eG (FWR). How can we combat climate change? What can we do locally to ensure our own energy self-sufficiency in future? And what role can environmentally friendly and sustainable solutions play in regional development?

“This is something we have to tackle together at a local level”, thought Michael Diestel, managing director of the Rhön-Grabfeld district branch of the Bavarian Farmers’ Association, and the district chairman Matthias Klöffel. “The best option would be a cooperative.” Their motto: take practical steps, rather than just debate about climate change. In the process, the founders of the cooperative consciously focused on the self-help approach of the cooperative movement’s pioneer, Raiffeisen. The cooperative was founded in Bad Neustadt an der Saale in June 2008. Here in the Franconian Rhön region, groups of individuals are busy promoting cooperatively-owned facilities that generate renewable energy. The cooperative provides private individuals wishing to invest in renewable energy sources and support their use through modest financial contributions with the chance to link up with like-minded people. This not only concentrates available capital, but also legal and economic expertise. After all, not everyone has the necessary expertise and experience required for the construction and operation of such facilities.

Tapping new site potential
An energy cooperative not only pools the interests of private individuals, but also motivates the owners of suitable rooftops to have photovoltaic systems installed. A farmer may toy with the idea of installing a system like this on one of his barns, but frequently the effort and risk required is too great to consider going it alone, especially if the project is likely to entail considerable investments additionally to his farming ones. The investment project would not only considerably restrict his financial flexibility for his core business of farming, it would also involve administrative and insurance costs, not to mention associated risks – none of which should be underestimated. These responsibilities are more easily and more effectively handled in a cooperative context. Cooperatives offer a major advantage in that they can tap into the potential of sites to which private individuals would never gain access on their own. “In rural areas there are plenty of unused rooftops. Lots of churches, supermarkets, farm or community buildings could be fitted out with solar systems”, Diestel comments on the enormous potential of suitable sites. The owners of these rooftops can either allow the FWR to use these areas for free, or rent them to the FWR, even if they themselves do not wish to be financially involved.

Implementing projects
The FWR’s first photovoltaic system was installed on roofs belonging to the Bad Neustadt municipal works yard in November 2008. Its peak capacity is 270 kilowatts and it will be producing an estimated 235,000 kilowatt hours of electricity per annum. The average annual electricity needs of 60 private households can be covered by a facility of this size. With a service life of 20 years, the system will save approximately 4,150 tonnes of carbon monoxide (CO$_2$). Those who invest 4,000 euros in the facility contribute directly to the production of green electricity in an amount approximate to that which they consume annually in their own home. Overall nearly 1.1 million euros have been invested in the project. Two thirds have been financed by borrowed capital and one third by equity. Every Bad Neustadt resident is entitled to be involved in the energy project, the minimum share in the investment being 2,000 euros. For each share, one hundred euros goes to the cooperative as a share, while the remaining 1,900 euros are invested as a subordinated loan (20-year maturity) to finance
the project. Based on a conservative estimate of electricity yield, the effective interest rate of this investment will be 5.5 percent per annum. If this estimate is exceeded in sunnier years, every member will be awarded a bonus of up to four percent. Each of the 38 partners in the Bad Neustadt solar facility has been issued with an energy savings book, reminiscent of a conventional bank savings book. Every year members receive a statement of their account which they can glue into their energy savings book. The statement records the interest and \( \text{CO}_2 \) saved for the year in question, as well as a comparison of projected and actual figures. It’s a neat way of simultaneously presenting the investment and the individual’s own contribution to environmental protection.

Using local resources
The production of renewable energy is also intended to support the region. “Our motto is to use local resources and feed the profits generated back into the local community and for the benefit of residents”, explains Diestel. “In this way we adhere to the traditional principle of the rural loan associations: ‘the money of the village for the good of the village’.” Accordingly, local tradesmen are responsible for installing and maintaining the technical facilities. A regional bank handled the loan arrangements. The shares in the solar system too were offered first to Bad Neustadt residents, then to residents in the outlying area, and only then to investors from outside the region. The initiators term this the ‘onion skin principle’. The aim of this is to involve as many people as possible and yet as few as necessary. The community also benefits: from additional trade tax income. One major benefit of the cooperative model is that liability is limited to the extent of the personal investment. “You simply sleep better when you know that an expert is regularly checking the books, especially in the case of such a capital-intensive project”, says Diestel. The expert in this instance is the regional cooperative association, which monitors the commercial interests of all its members. “For us, being audited by the cooperative association is an essential advertising tool. We associate it with a promise of quality, which is crucial when it comes to winning people’s trust”, Diestel continues. Boosting the region’s profile is also central to another project: a photovoltaic facility is financing the urgently required stadium roof for TSV Großbardorf football club. A roofed stand is one of the conditions imposed by the German Football Association (DFB) on clubs in the upper football divisions. The roof is to be built, then rented to the cooperative and used as an energy-generating location. The price of renting may reduce the rate of return for the individual investors, but at the same time TSV Großbardorf can now return to playing on its home pitch. Everyone involved is also issued with a season ticket for all home games. So everyone wins out: the football fans, the club, and the environment. Diestel already has other plans up his sleeve, “The medium-term aim is to expand Friedrich Wilhelm Raiffeisen Energie eG to such an extent that inhabitants of the Rhön region will use their own green electricity. To achieve this, we will not be confining our activities to solar energy in future.”
Energieversorgung Honigsee eG

Heating together
A village runs its own cooperative local heating network

It was the perfect opportunity: on the edge of Honigsee, a village in Schleswig-Holstein, a biogas plant was constructed, the release heat from which could be used for heating buildings. But neither the local authority nor a utility company was prepared to run the energy network. It was going to be up to the residents to take action. But how do you persuade 450 people? And what obstacles are you likely to come up against?

“The idea for our local heating network originally came from two farmers who had invested in a biogas plant”, recalls Dr Frank Heblich, today the voluntary chairman of the board of Energieversorgung Honigsee eG. The biogas was to flow through two cogeneration units – but initially there was no concept for using the heat produced as a by-product. “One evening we were sitting in the garden with some of the other residents and the mayor and wondering whether it would be possible to use the heat to heat private houses.” A handful of enthusiastic individuals decided to investigate further and organised a visit to the bio-energy village of Jühnde. “At the beginning we had no idea what we would be facing and where we should even start. We had a lot to learn from others”, recounts Heblich. During the visit to Jühnde the initiators became convinced of the idea’s potential. Now all they had to do was win over the residents of Honigsee. First of all they assessed the village’s annual consumption of both heating oil and gas. This provided them with a rough basis for their calculations and one element of the necessary commercial feasibility study.

Personal involvement pays off
Initial calculations produced an investment total of more than one million euros. As sole investor, the village was unable to raise that amount, and the regional utilities and power companies remained uninterested. Heblich explains, “They considered the financial risk to be too high. Their sober verdict was that it wouldn’t be worth their while financially.” So it was up to the residents to take matters into their own hands. With success: the residents of Honigsee invested hours of their own time in promoting the local energy network. At the outset the initiators held several fact-finding events to persuade local residents of the benefits of a common heating network. They approached their neighbours openly and honestly, along the lines of “all or nothing”. For the facility to be viable, the residents would have to voluntarily shut down their oil heating systems and commit to being supplied with heat from the new network. “Many were scared they might suddenly find themselves completely without heat in the middle of winter”, Heblich continues. But these fears were swiftly quelled – after all there were many other sound arguments in favour of the joint network, such as independence from the major energy companies and the increasingly unpredictable price of fossil fuels. Moreover the idea of replacing old and generally bulky heating systems in house cellars with smaller heating network transfer stations was a welcome one. The decision to invest was made easier by the promise of additional space and improved living comfort. In addition, many were keen to be involved in producing energy in a clean and environmentally friendly manner. But the main attraction proved to be the concept of low and transparent heating costs.

Information and transparency
The network of pipes was installed in the late summer of 2007. During the four-month construction period, weekly meetings were held to keep residents informed about the project’s progress and any problems that might have arisen. “We made sure people were informed well in advance about closed roads or construction noise. In retrospect, the active and pre-emptive approach to communication that was taken did a lot to foster acceptance among those residents affected – even if things didn’t always go according to plan”, Heblich sums up. “During the construction phase we were constantly being confronted by snags in
our planning which cost both time and money. Whether we’re talking about boulders under the road or unplanned drilling through house walls.” But we also presented these delays and unforeseen costs openly and transparently. And finally, the legal form also played an important role in the community’s acceptance of the local heating network: “When you’re looking to involve lots of people, and you’re reliant on people volunteering and taking the initiative, and when people earning a normal wage are to have just as much say as the millionaires, then a cooperative is the only option”, explains Heblich. The cooperative is democratic in structure: this means that regardless of the extent of their investment, all members have only one vote each and thus an equal say. As a result, a cooperative can never be bought out by an external investor. A cooperative is professionally managed by a management board and an advisory board; with a bankruptcy rate of just 0.1 percent, it is the most secure legal form in Germany. The consulting and auditing support provided by the cooperative association also helps consolidate this status.

Many shoulders share the cost
In the end, it was possible to reduce the entire investment to 630,000 euros, mainly because the residents did a lot of the work themselves. For instance, they dug out the pipe connection trenches on their own property themselves. Several years previously the community had also intended to renew the street lighting. Now the excavation work could serve a dual purpose. As a result the village and the cooperative each saved 30,000 euros. A large proportion of the pipe network was also laid through empty meadows and along verges.

The financing of the heating network has been shared around many pairs of shoulders. On the one hand, members bought shares in the cooperative – a minimum of 15 shares at a cost of 100 euros each. This raised a total of approximately 65,000 euros in equity. On the other hand, the local authority bought into the cooperative to the tune of some 100,000 euros. Local authority dividend certificates were purchased by the cooperative, subject to annual interest at three percent above the base rate and to be repaid after a maximum term of 20 years. A grant of 100,000 euros – investment assistance provided by the Schleswig-Holstein Fund – was also approved. The remainder took the form of a loan from the local Raiffeisenbank. At last, on 1st October 2007, it was time: the local heating network supplying 38 houses and 54 households was commissioned. Since then, members have been paying 3.8 cents per kilowatt hour of heat used and a monthly fee of 12 euros. “Our energy costs are so low that, in the end, even residents who had replaced their oil heating a mere nine months previously joined the project”, reveals Heblich. The local heating network has enabled the village to reduce its CO₂ emissions by 30 percent. Heblich recommends that those wishing to follow suit should visit successful bio-energy villages first, and then make sure there is a definite focus on transparency, information, and the active involvement of local community members. “Find time to talk to experienced initiators, those who were once in the same situation as yourself. That way you’ll make fewer mistakes – which after all can end up costing a lot of money.”
Energiegemeinschaft Weissacher Tal eG

Success factor local government
Energy cooperative initiated by a Baden-Württemberg village

Local government can contribute significantly to the success of an energy cooperative, working together with residents in the implementation of renewable energy projects. Nevertheless, the relevant state regulations must still be observed – including for instance local by-laws. How can local government assist dedicated individuals? How can regions manage to create an independent energy supply in future? And how does a local authority itself become the initiator of an energy cooperative? The village Weissach im Tal has already gone down this path.

“We felt it was extremely important that every interested party in the region should have the opportunity to be involved in this project. That's why we opted for a cooperative, as being the most equitable, democratic and by far the most widely accepted form of equity participation”, explains Ian Schölzel, mayor of Weissach im Tal, who doubles as the voluntary chairman of the cooperative’s supervisory board. As such, Schölzel is in a position not only to voice matters of public concern, but also to hear about new plans and projects first hand. Contacts are therefore very close, allowing projects to be implemented more quickly.

The founding of an energy cooperative
The energy cooperative was established relatively quickly, since the local Raiffeisenbank – together with the local council and the cooperative association – was quick to complete the financing plan and the cooperative articles. Owing to state by-laws, however, there was little scope for the local authority to be financially involved in the cooperative itself: among other things, Baden-Württemberg by-laws stipulate that the local authority must be represented on the board. Since however the managing and supervisory boards of a cooperative cannot be voted in until the cooperative in question has been founded, controversy was inevitable. Moreover, the Weissach im Tal council had originally intended to invest a higher sum than was eventually paid out: the local government supervisory authority filed an objection. “In the end, the local council invested 5,000 euros”, recalls Rudolf Scharer, local council employee and manager of the energy cooperative office in Weissach im Tal. Once an agreement had been reached with the local government supervisory authority, the local council held a residents' information event. “We founded the cooperative that same evening. The information was still fresh in everyone’s minds and there was no need to organise a separate meeting”, explains Scharer. 79 residents decided to invest in the cooperative that day.

The energy cooperative grows
The cooperative was founded in November 2008. Just a month later the first three photovoltaic systems had already been installed. The requisite rooftops were provided by the local council. It was therefore able to support the residents’ commitment without having to invest huge sums. The three systems featuring thin-film modules have been installed on the fire brigade’s equipment depot in Aichholzhof, on the roof of Oberweissach primary school, and on a new warehouse at the works depot in Bruch. All the roofs are owned by the local council and have been put at the cooperative’s disposal rent-free. The energy cooperative began operating with 107,000 euros. By December, that is within just one month, investment had risen to 394,000 euros. By August 2011, three years after it was founded, membership of the energy cooperative was already at 239 – and still rising. More than 14,000 shares in the cooperative at 50 euros each had already been bought by residents. This investment has been used to install ten photovoltaic facilities – the majority on council building rooftops – which produce in the region of 330,000 kilowatt hours of electricity per year. However, despite the millions in total investment, the energy cooperative remains a participation option for all residents. The youngest member is currently just seven years old. Occasionally the
intake of new members has even had to be halted owing to the extent of demand, for instance, when there were no more roofs available in which to invest existing funds. The mayor and local council were however once more able to help out.

The energy cooperative pays off
“For us, much of the project is down to idealism”, explains Rudolf Scharer. Despite this, it is important not to lose sight of the economics of the situation, since the cooperative is first and foremost a commercial enterprise. With an expected return on investment of some four percent over a 20-year term, the Weissacher Tal eG can afford to be proud of its achievements. Since most founders of cooperatives are not business professionals, they rely heavily on the expertise of the regional cooperative association and the local Raiffeisenbank. At the same time, these bodies guarantee high standards for the energy cooperative as a commercial enterprise. “The advice offered by the regional cooperative association is invaluable”, advises Scharer. The experience of outsiders is especially helpful in drawing up the cooperative’s articles, since many statutes need to be individually determined according to the needs of the organisation. The association also offers help in the planning of commercial activities. As a result, the cooperative business model becomes a secure framework through which the commitment of individuals to renewable sources of energy can be channelled into specific and economically viable projects. Those engaging in cooperative activities should however not only rely on expertise from outside: internal strengths also play a major role in the success of an energy cooperative. “If possible, individuals with the relevant expertise should sit on both the managing and supervisory boards”, emphasises Scharer. Commercial and technical know-how is invaluable to every cooperative.

Council and cooperative in tandem
The Weissacher Tal energy cooperative also has the involvement of the local council to thank for its success. “You should definitely contact the local government supervisory authority in advance – as well as trying to get the mayor on your side as soon as possible”, advises Scharer. Local council assistance can be as simple as providing the rooftops. In comparison to those in private ownership, they tend to be larger in area and better suited to energy production. An energy cooperative can also draw on far more regional investment capital than a local council or individual investor in the region would be able to. “When you found an energy cooperative together, those involved are faced with a lot of new tasks”, reflects Scharer. In retrospect however, one thing is clear: local councils can have a crucial impact on the successful launch of an energy cooperative, adding their expertise to the preparations – or drawing on expert help from outside – and staging information events. Local council input is not limited to the creative side – infrastructural support is also especially appreciated. By contrast, in smaller communities without a local council or utility company, energy cooperatives facilitate the implementation of specific projects. Energy cooperatives such as Energiegemeinschaft Weissacher Tal show that the supply of renewable energy can be realised by residents, thus paving the way for decentralised energy supplies in future. All those living in Weissach im Tal benefit from the additional tax revenue, the planning and work contracts, the subsequent investment, and last but not least the contribution towards climate protection.
Hugging the wind
Regional residents’ wind farm cooperative

Many people support the expansion of renewable sources of energy. But whenever an energy project is planned right outside someone’s front door, consent can start to disintegrate. Wind power in particular is unpopular with residents in many regions: one area in southern Hesse has founded a cooperative with the aim of taking a sober and pragmatic approach to this climate-friendly energy source.

“If you’ve got to look at it, you might as well get the benefit”, says Micha Jost, board chairman of the Starkenburg eG energy cooperative. Jost had long been committed to the idea of using a cooperative to build more than just photovoltaic facilities in his local area. He had in mind that a cooperative would work in the case of wind turbines too, which entail a lot more financing, planning and construction effort. The first cooperatively owned wind turbine was a chance affair: financing was still needed for a wind farm which had already been approved near Seeheim-Jugenheim.

The cooperative model breeds acceptance

Two wind turbines had been planned for the “Neuterscher Höhe” for some time. “Public opinion in the direct vicinity was clearly against the project and the local newspapers too were very lukewarm”, explains Jost, who works as an environmental representative for a local council in southern Hesse. “At the beginning, we had our heads to the wind, so to speak.” But as soon as the residents of the neighbouring communities – Seeheim-Jugenheim, Modautal and Mühltal – got the opportunity to invest in the wind farm via the cooperative, acceptance for WindSTARK 1 began to increase: 230 residents from the region have since invested in the wind turbine. Almost half of them are people who live in its direct vicinity. The energy cooperative was founded in December 2010 in Heppenheim. It regards itself as a politically neutral body of individuals and its aim is to promote the generation of renewable energy in the Starkenburg region. “In the first place, we’re keen to involve the people who live close to the project sites”, continues Jost. “We particularly wanted to target those residents who either didn’t own their own property or had no funds to install a system of their own. Since the focus from the outset was on wind energy – which requires a comparably high level of equity – we deliberately opted for a regional approach. The idea was to reach as many people as possible in many different villages. “We were extremely surprised by how much private capital there proved to be in the region and by the willingness of people to invest in the new cooperative”, reveals Jost. The amount of effort required by a wind energy project cannot be compared with that of a photovoltaic system either: complicated planning legislation, lengthy approval procedures, technical and legal expertise, the need for extensive maintenance and repairs, as well as the necessary insurances and operations management make wind power far more challenging than all other renewable energy sources. Approximately two years should be allowed from the first plans to implementation. A cooperative generally isn’t able to manage this from a standing start. That’s why the residents of Starkenburg called on the services of an extremely experienced project developer from Heppenheim.

Sound calculation

However, despite the cooperative involvement, it was not all plain sailing for WindSTARK 1. But after final clarification by the Darmstadt Administrative Court, the work could go ahead: on 30th July 2011 on the Neuterscher Höhe, a ground-breaking ceremony was held for the wind turbine. Every year the turbine will generate some five million kilowatt hours of electricity. Statistically speaking this is enough to supply 1250 households with their annual electricity needs. The facility will save some 2,800 tonnes of CO₂ per annum. The funding volume for WindSTARK1 is in the region of 3.5 million euros. By contrast, Jost describes the cooperative’s photovoltaic systems as a “warm-up”. They were completed a few weeks
before construction work began on the wind turbine. SolarSTARK 1 is the name given to a system installed on the roof of a factory in Heppenheim, with a peak capacity of 140 kilowatts. The SolarSTARK 2 project with a peak capacity of 19.5 kilowatts has been fitted on the newly refurbished community hall in Ober-Laudenbach. In accordance with the Starkenburg approach already mentioned, the investment opportunity was initially offered to residents of Heppenheim and Ober-Laudenbach respectively. Another aspect of the cooperative’s philosophy is the conservative nature of its calculations: Jost says, “We would rather guarantee people a little less than disappoint them later – if the return on investment doesn't turn out to be as high. Since we all live in the area, that’s really the only option anyway.” The cooperative is not the place to make a fast buck. Any involvement represents long-term and sustainable investment in climate protection – while being an incentive for members to address the topic at a local level.

**Becoming a member**

To become a member, you need to purchase two shares at 100 euros each. When it comes to a specific energy project, the member then grants the cooperative a subordinate loan for an additional 1,800 euros. The loan interest rate – with a term of 20 years – is recalculated for every project. And the calculations err on the side of caution: should the yield from the cooperative’s energy projects as a whole prove to be higher, this additional sum is distributed to members on the basis of the number of shares purchased. Furthermore, the level of payment is decided on by the members themselves at the general meeting. A short summary of coming energy projects is published on the [www.energiestark.de](http://www.energiestark.de) website. Interested parties can request a brochure featuring a comprehensive description of the project. Those who are serious about investing can then register their interest, stating how much they wish to invest. If there is sufficient interest, the paperwork – that is, the membership application and loan contract – is dispatched to make involvement in the project official. “This enables us to attract interested parties to our projects step by step. We don't want to come across like an insurance salesman, we want people to track the projects and their progress over years.”

The wind turbine was financed together with the Odenwald energy cooperative. These days the initiators of the energy cooperative give talks in many different places. At town meetings and in discussions, they realise that wind power is a topic which attracts many people, and that they are also very interested in the cooperative model. For Micha Jost there's a very emotional side to the business model, “The cooperative philosophy has a soul – it not only appeals to your heart, it appeals to your head too.”
Energiegenossenschaft Lieberhausen eG

With wood, rhyme and reason
Well calculated: a bio-energy village in stages

Autumn 1997: In Lieberhausen, a satellite of Gummersbach in the Rhineland, the board of the village association was holding a meeting. The community was planning to update its sewage system. The discussion centered on whether the opportunity could also be used to install a new energy network based on renewable sources. But how do you get from a freshly dug ditch to an energy supply for the entire village? Where do you start with such a project?

“The first step was to approach our regional utility company”, recalls Bernd Rosenbauer, co-initiator and today chairman of the Lieberhausen eG energy cooperative. “We asked how much the construction of an environmentally friendly energy network would cost each resident. When we heard the price, we dismissed the idea immediately.” Each household connection would cost approximately 12,000 euros. Another way had to be found if the original vision was not to simply disappear. So it was important to get the residents of Lieberhausen actively involved.

Careful implementation follows critical appraisal
Initially, the reaction of the residents was one of extreme caution and scepticism. Several times Rosenbauer was asked whether Lieberhausen was being used as a guinea pig. Thereupon, the initiators, accompanied by interested residents, visited two wood-based heating systems which were being used to supply several residential buildings with heat via a distribution network. These fact-finding missions were a major factor in persuading the villagers to install their own local heating network. A feasibility study was conducted – and the project was approved at the very next annual meeting of the village association. With the support of EnergieAgenturNRW, various possibilities concerning the project's implementation and financing were discussed. At least 40 households would need to take part for the system to pay off. To the surprise of the initiators, 42 households agreed to be involved, although the calculated energy price was more that the current cost of their own oil heating. But even then, it was obvious that the price of fossil fuels was going to continue increasing. “Our neighbours reached a very rational decision. All those involved agreed that this wasn't about a political debate, but about the common future of our village”, explains Rosenbauer. These days, 92 of a total of 108 houses in Lieberhausen are connected to the local heating network.

In April 1999 the Lieberhausen eG energy cooperative was founded as the body responsible for the heating plant and local heating network. This legal form provides the perfect context: for a type of organisation that accommodates the requirements of a local heating network – i.e. many users – while relying on resident participation. “The villagers themselves needed to have a direct say – after all we wanted to get everyone actively involved. A project by residents for residents, where no-one could come from outside and tell us what to do”, continues Rosenbauer. Thanks to the villagers' own initiative, they saved themselves a great deal of money during the planning, construction and operation of the plant.

Forest waste heats living space
The bio-heat is generated by a woodchip-fired heating plant, fed by material from local forests. The idea was Rosenbauer's, who had asked himself ever since he was an apprentice forester whether it wouldn't be possible to change from oil to wood as a source of energy. Lieberhausen has proved that this is possible. In the run-up, several residents were worried that the local forest would have to be felled to provide enough wood for the plant. But that is not the case: enough wood is made available from the region's forests by regular forestry maintenance. The cooperative gets its supply from the various forestry offices responsible and fosters close links with the Lieberhausen forest enterprise community, as well as larger private forestry commissions in the area. The wood-fired heating plant is
equipped with a grate furnace (970 kilowatts of total rated output). This type of furnace is extremely robust and allows the use of different grades of fuel – sawdust, bark chips or longer sticks of wood. The heating material is pre-dried in a warehouse with a capacity of 3,600 cubic metres, which was built by the cooperative in 2004. Via a storage silo, the wood chips are automatically fed into the furnace, which heats water for the heating network to a temperature of 90 degrees Celsius. A reserve oil-fired boiler with a capacity of 1,400 kilowatts is in place to cope with any system failures. A total of 1.7 million euros had to be raised for the heating plant and 6,230 metres of piping. The members bought shares in the cooperative to the tune of 90,000 euros. The cooperative fee for each member was set at 1,050 euros, and an additional network fee of 1,500 euros also had to be paid. Each house connection cost approximately 3,000 euros, meaning that each household had to invest a total of 5,500 euros in the project. The network enables a family living in an older property to save approximately 1,000 euros a year in energy costs – by the sixth year, the plant has already started to pay its way. Moreover chimney sweep fees were a thing of the past, and it was no longer necessary to store hazardous substances in the home. Since the oil tank and boiler were now also gone, home owners could enjoy additional cellar space. The plant was financed with a loan from the KfW banking group and with a subsidy amounting to 700,000 euros.

Voluntary involvement lowers costs
Thanks to the dedicated involvement of the Lieberhausen residents, it was possible to complete the project swiftly and affordably. They spent more than 5,000 hours assisting voluntarily in the construction of the plant, and dug the ditches for the pipeline connections to the houses themselves. Much of the plant operations and accounting are also in voluntary hands. The plant is monitored by the residents on a 400-euro job basis. In addition, the furnace needs to be cleaned every three months – this work is also done by the members. This keeps running costs down and strengthens the sense of community within the village. “A lot has changed here in ten years”, admits Rosenbauer. “Having maybe smirked at our idea initially, the utility company now comes to us for fuel and expertise.” In addition to supplying heat, the cooperative has established a wood processing and sales division. These days some 40 percent of turnover is generated by the sale of wood chips and firewood, recognised by an official amendment to the cooperative articles. And now the villagers of Lieberhausen receive visits from other interested villages and interest groups. The transfer of knowledge and the preparatory planning for other villages represent additional sources of income for the cooperative. The village guesthouse and B&Bs are delighted by the influx – almost 600 groups of visitors have been recorded to date. The cooperative has also changed the way the villagers work together: in the old days the tone was one of heated debate and dispute – these days, decisions are reached far more quickly. The cooperative’s decision to invest in a photovoltaic system, for instance, was reached within ten minutes. Rosenbauer recommends patience to those with a similar vision. If the concept is economically feasible, you can’t let obstacles put you off. You have to convince people with good argumentation, reveal the path to be taken and any problems that might occur, and above all be honest with each other. “It’s what you can’t see, the immaterial side of the project, that is so challenging yet crucial to a sense of shared success. Our top priority was always to inform people immediately and thoroughly about any developments.”
NEW Neue Energien West eG

Ten villages – one aim
Villages and residents cooperate in the development of renewable sources of energy

In many rural districts, it is the car number plate with its regional letter code that creates a common link between the towns and villages. Many people identify closely with their number plate – especially when on a touring holiday. Yet joint energy concepts across local boundaries remain difficult to implement. Not so in the rural district of Neustadt an der Waldnaab. A new cooperative is in the process of demonstrating how villages and their residents can help develop an energy supply using renewables.

“We deliberately adopted the number plate letter code as our company name to emphasise the cooperation across our home region”, reveals Helmut Amschler, member of the NEW – Neue Energien West eG – supervisory board, and board chairman of the Grafenwöhr public utility company. Now NEW not only stands for the rural district of Neustadt (Waldnaab) in the northern Upper Palatinate region, but also for the energy cooperative involving all the communities in it. Under the motto “From the region – for the region”, ten towns and villages decided in February 2009 to convert their energy supply to renewables by the year 2030. The initiative to found a cooperative came from the Grafenwöhr public utility company, which had already spent some time considering how to promote renewable sources of energy at a wider level than the immediate area. The idea of a cooperative involving several towns and villages was mooted and subsequently approved by the utility company’s board of directors. Community representatives were delighted. “After that happened, I went around visiting the mayors and local councils in the district with a simple PowerPoint presentation to plead for the project. Gradually I managed to persuade all of them”, recalls Amschler.

Clear separation under a single roof
To a certain extent, NEW is the roof over various renewables development projects. The articles specify that the cooperative is only allowed to invest in the field of renewable sources of energy. The villages and local businesses from the region have bought directly into the joint company. Membership is conditional upon the purchase of at least one share, the price of which is 5,000 euros. To date there are 16 member communities, holding a total of 76 shares in the cooperative. Three mayors make up the board of directors, while the other local representatives sit voluntarily on the supervisory board. Individual residents from the region are also involved in NEW. Although they cannot be direct members of the NEW cooperative, they can purchase shares in a second cooperative: the Bürger-Energiegenossenschaft West eG (BEW). This cooperative in turn enjoys full membership of NEW. There was good reason for this separation: “This was necessary to separate fundamental decisions on sites and regional energy projects on the one hand, from the personal decisions and concerns of individual residents about energy projects affecting their village on the other. This umbrella structure means we have an overview of the region as a whole, while involving local residents at the same time”, explains Amschler. As a result, the cooperative business model not only facilitates cooperation and a balance of interests between the different communities, but also the active involvement of the local population. Any resident willing to invest a minimum of 500 euros can invest in BEW. Currently, 750 private individuals have bought 10,000 shares in the cooperative. The entire sum of 5.15 million euros is made available to NEW for investments. These figures confirm that the residents trust their local authorities and that, thanks to the cooperative model, no-one enjoys an unfair advantage.

Once is never enough – thank goodness!
“Interestingly the cooperative principle of ‘one member – one vote’ makes the discussion and decision-making process among the different villages and residents much easier. Contrary to what you might expect, there is no barrage of opposition from individuals, instead everyone
seems to recognise the need to find balanced solutions together”, reveals Amschler. If a village fails to get approval for a project, it is included in future deliberations about other projects. Unlike a straightforward financial holding, a cooperative is actually a regional company set up for the long term. ‘Once is never enough’ – this positive expression is confirmed time and again. The residents’ confidence is further reinforced by the fact that there is no obligation to make subsequent payments. Each person’s financial risk is limited to their initial investment. A cooperative is committed to the interests of its members (rather than that of an external financial investor), it is particularly resistant to bankruptcy, and a hostile takeover by a major energy company, for instance, is not possible. Finally, BEW has three representatives on the NEW supervisory board. To date, however, there has been no occasion to veto, “We don't go in for ego wars”, adds Amschler. “We work together on a factual and objective footing: when it comes to reaching a decision political party allegiance is quite irrelevant. Everyone knows we're concerned about the future of our own region.” And here's another example: One village wanted to erect a solar farm. The electricity cables linking up to the distribution network would have had to have been routed through land belonging to the neighbouring village. Anywhere else, a dispute over rights of way would inevitably have led to the project being cancelled. Not, however, under the aegis of NEW: “Once I'd explained that in future the local energy network would also be able to receive the electricity generated by a facility belonging to the neighbouring village, all the envy and focus over rights of way disappeared”, explains Amschler. Another factor in maintaining fairness is that NEW and BEW members – i.e. all the residents and communities – receive the same rate of interest. In 2009, they were paid 3.25 percent, rising to 3.8 percent in the following year. BEW also offers its members additional energy-related bonuses, such as special energy consultancy services and thermophotography for home owners, group insurance for owners of photovoltaic systems, or reduced prices when it comes to purchasing cleaning equipment.

**Capacity? Growth? Absolutely!**

During the first year, a total of three rooftop photovoltaic systems were installed with a peak capacity of 50 kilowatts. They were financed entirely using equity. Seven rooftop photovoltaic systems with a peak capacity of 241 kilowatts and two ground-mounted photovoltaic facilities with a total peak capacity of 3.1 megawatts were added in 2010. A total of nine million euros has been invested to date. This year – 2011 – should see the construction of additional photovoltaic systems, including two ground-mounted facilities with peak capacities of 2.1 and 1.8 megawatts respectively. By the end of the year, more than 7.4 megawatts will have been installed to date. Local heating networks and both biomass and woodchip-fired heating plants are already in the pipeline. Following in-depth research, they also hope to install wind turbines and hydroelectric plants – according to the ‘anthill principle’, as Amschler likes to call it. By that he means a decentralised distribution of renewable energy sources combined with value creation that is kept inside the regions. “Desertec and offshore wind farms are not the only option for the future. The energy policy change represents a great deal of potential for the regions too”, concludes Amschler. At any rate, the NEW rural district has made regionalism, sustainability, and community its watchwords.
Neue Energie Genossenschaft eG

Urban renewables
The energy cooperative – a model for city living

What business model is suitable for solar projects run by urban residents? A question asked and promptly answered by some dedicated inhabitants of Potsdam with the founding of the Neue Energie Genossenschaft eG on 4th April 2008. But before they had managed to found the cooperative and commission the first facility, the members had already had to overcome plenty of obstacles.

“We wanted to give the inhabitants of Potsdam a chance to invest small sums in projects based on renewable energy sources”, explains Sophie Haebel, managing director of the Neue Energie Genossenschaft eG (NEG). Just 500 euros were enough to purchase membership in the cooperative. On the face of it that doesn’t sound like much. The more people that get involved, however, the greater the scale of project that can be undertaken. The eight founding members set themselves an ambitious target for the first project: they aimed to drum up investment amounting to approximately 250,000 euros. The NEG hit the mark – raising the amount with the help of 62 shareholders. When it came to a second facility, the cooperative set the necessary investment at 470,000 euros. And it reached this target too – a true success story.

Enthusiasm turns into business venture
Let’s go back to the beginning: the Potsdamer Solarverein was founded on 21st March 2007 out of a basic commitment to renewable sources of energy and an awareness for the environment and for climate protection. Witnessing the specific problems associated with the construction of renewables-based energy facilities in Potsdam, the Solarverein gradually became dissatisfied with its role as a mere pressure group. The members wanted to get involved themselves and prove that renewable sources of energy can provide every inhabitant with the option of taking part in a decentralised energy turnaround – even in an urban environment. A club is not however a suitable setting for the level of business activity required by energy projects. One of the major challenges when it comes to installing such systems is finding suitable areas in a city setting. Since many people live in apartment blocks, they have to reach an agreement with the landlord and the other residents as well. That can often be difficult and is an obstacle to the development of inner-city photovoltaic facilities. That's why municipal rooftops belonging to schools, the fire brigade or police stations represent a huge opportunity – especially for energy cooperatives that are able to call on sizeable investment sums. The first NEG photovoltaic system was in fact installed on the roof of a school. But first the eight-strong group of initiators had to raise the initial capital and come up with a founding concept. They had the cooperative association check the cost calculation and the articles in particular – this is essential if the cooperative is to be listed in the register. After a record-breakingly short assessment period of just 24 hours – at correspondingly low cost – the cooperative association confirmed in May that the NEG had successfully passed its initial audit. Its start-up capital amounted to 28,500 euros. Entry in the register of cooperatives took place in July 2008.

Successful start
The first project, already mentioned, was a photovoltaic system with a peak capacity of 60 kilowatts installed on the Montessori school in West Potsdam. For the project to be realised, the eight founder members had to raise 250,000 euros in addition to the initial capital they had invested. As well as organising a press release and setting up a website, it was word-of-mouth via friends and acquaintances which proved most promising. Moreover, the cooperative already had access to a well-functioning network, thanks to the Solarverein. An internal tip-off led them to the school roof. In the end, 62 shareholders were able to raise more than half of the investment sum required. A loan was used to finance the rest. “The roof
of the Montessori school offered the perfect orientation and angle”, recalls Haebel. “And it amounted to 700 square metres of space.” This was a fantastic opportunity for the newly founded company. Before construction could begin however, the energy cooperative was faced with yet another challenge: The roof of the school needed replacing, but Kommunale Immobilien Service (KIS), a company owned and run by the City of Potsdam, refused to cooperate. Only when the NEG declared its willingness to pay a third of the amount necessary to replace the roof (60,000 euros) did the KIS agree. So having contributed 20,000 euros already, the cooperative was not required to pay rent for using the roof, thus offsetting the cost of its replacement. Both parties signed the roof licensing agreement on 6th August 2008. At the end of August 2008, the cooperative commissioned an engineering office with the construction of the facility. The project commenced mid-September with the replacement of the roof by KIS. At the same time, inverters were installed in the cellar – not to mention endless cables. Progress on the roof replacement made it possible to mount all the photovoltaic systems on the Montessori school within just four days in November. On 5th December 2008 the system was connected up to the Potsdam electricity network.

![Image of the Montessori school with solar panels](image)

**Good for the environment, residents, and the city**

At the time, it was one of Potsdam's largest photovoltaic facilities – with an electricity yield of approximately 55,000 kilowatt hours. This also clearly demonstrates the potential of a renewables-based energy supply in an urban setting. Furthermore, the facility shows just what residents can achieve in their neighbourhood in terms of the development of renewable energy sources, and what advantages the cooperative business model offers – particularly in cities. “The fact that our own facilities produce enough energy to cover what we consume is an indescribable feeling”, reveals Haebel. Another major advantage of the cooperative model is also the potential for growth. After all, an energy cooperative may operate more than one facility. The problem for NEG was less one of financing and of acquiring new business partners, and more one of locating new and suitable rooftops. But the cooperative was successful there and is now in a position to realise its second project, on the roof of the police operations centre in Potsdam-Eichen. The facility will be almost three times larger than the one at the Montessori school and will generate approximately 160,000 kilowatt hours per annum. The investment sum of 470,000 euros is being contributed by members from all over Germany. “Thanks to the website, the sky’s the limit”, enthuses Haebel. Due to the subordinated loan model typical of energy cooperatives, it has even been possible to manage without a second bank loan. “With a single investment of 2,700 euros, you can ensure your annual electricity consumption of approximately 1,000 kilowatt hours is made up entirely of renewables”, explains Haebel. That may be the idealistic reason for investing in an energy cooperative. The financial one is an ROI of approximately four percent.
**Volkswagen Belegschaftsgenossenschaft eG**

**Economic strength and a renewable future**  
**The Volkswagen workforce cooperative for regenerative energy in Emden**

The energy cooperative set up by the Volkswagen workforce has its sights set on the future. At the same time, cooperatives have a long tradition among blue-collar workers. But how does a company within a company work? How can employees create a network? And what are the advantages of a workforce cooperative?

The workforce at the Volkswagen (VW) plant in Emden are proud of their company, their workplace, the Volkswagen brand – and since 2008 they are also proud of their workforce cooperative's photovoltaic system. The thin-film modules with a peak capacity of 280 kilowatts supply enough solar energy to provide 70 typical three-person households with a whole year’s worth of electricity. Factory Hall 1b – with a rooftop area of 6,500 square metres – certainly offered enough space. And the remaining factory halls and the site offer huge potential for further projects.

**The Works Council as driving force**

Before the energy cooperative could get off to a successful start, however, the Works Council in its role as initiator had to engage in some serious persuasion. One key figure was the employee representative Martin Refle, who became involved in promoting renewable sources on energy back in 1992. He had gained practical experience and theoretical expertise – which he was able to contribute to the energy cooperative – as a shareholder in two cooperative wind farms and as a member of the German Wind Energy Association. “In the early nineties, when we proposed to the Works Council that the workforce invest in wind turbines on the Volkswagen site, the time was not yet ripe. But the idea nevertheless triggered cooperation between the Emden local utility company and the VW plant”, recalls Refle. It was to take a whole decade before the concept of allowing employees to invest in energy facilities was to produce one of the first workforce cooperatives in Germany. “The rapid development of photovoltaics and the reform of cooperative legislation set the stage for the workforce cooperative’s success”, Refle sums up. Once the plant management had agreed to the project, the Works Council approached the workforce and informed them about the concept’s various options. In addition to the Works Council’s huge dedication, the leasing of the rooftop by the Volkswagen AG – for the nominal sum of one euro per year – also proved central to the implementation of the project. Some 219 employees at the Volkswagen Emden plant have now invested in the energy cooperative. The level of investment ranges from 200 to a maximum of 10,000 euros, which is the upper limit for share ownership. Shareholders’ equity constitutes 25 percent of the total investment amount. A dividend of five percent was guaranteed for the first year of operations. In the years that followed, the payout also amounted to five percent. The regional cooperative association provided specialist expertise, helping the Works Council to draw up the cooperative’s articles. The guarantee of expert advice is what makes the cooperative model so attractive to its members, as well as to the companies who provide the requisite rooftops. Industrial companies offer ideal conditions for energy cooperatives: generally there are lots of rooftops belonging to work halls, warehouses and administrative buildings, or even carparks suitable for carports. The renewables-based systems operated by the cooperative offer the workforce the opportunity to be directly involved in the energy turnaround – for the protection of the climate and as a safe investment. In addition, everyone is easy to reach within a company context, bumping into each other in the canteen and at Works Council meetings. And, thanks to the plant, there is already a major customer on the doorstep.
Everyone benefits

There were several reasons for Volkswagen AG to approve the workforce cooperative: the commitment of the workforce and the backing of plant management testify to a desire to promote renewable sources of energy. A joint facility – such as the VW Emden plant – in which members of the managing board were also willing to invest strengthens corporate cohesion and identification with the plant, and everyone is pulling together. By investing in an energy cooperative, the employees learn to appreciate commercial aspects of business – at bottom, after all, an energy cooperative is nothing more than a business. At the same time, the democratic structure of the cooperative means that all the business partners are equal. This has helped improve internal communications at VW Emden. In this way, it's not just the climate that benefits from the cooperatively operated photovoltaic facility, but the plant and the employees as well. The dedication of the Emden workforce to climate protection and their decentralised local supply of energy have also created a positive mood at the corporate level: Volkswagen AG intends to propose further internal and environmentally expedient workforce cooperatives, the idea being to master the challenges posed by the national energy policy change together with the workforce. “Discussions about the involvement of employees in this process have unfortunately yet to be concluded”, reveals Refle. For his part, the employee representative, who is also an active member of the IG Metall union, would like to ensure that the involvement of the workforce and this commitment to the energy policy change go hand in hand. “I believe that employee involvement and the commitment of Volkswagen AG in the field of climate protection complement each other perfectly”, says Refle. This includes additional cooperative facilities at the Emden location and other VW plants. The guaranteed return of five percent and the spaces open to development offer a lot of additional potential. And so they’re looking to the future: to 2013, when the first wholly electric Golf car is due to be launched. It could drive off from the plant powered by solar electricity generated by the workforce cooperative's facilities – in the direction of the wind turbines that can be seen from the roof of Hall 1b. The energy supply of the future has already begun in Emden.
Alb-Elektrizitätswerk Geislingen-Steige eG

Regional energy supply
From residents for residents: operating locally for more than a century

In Germany, the supply of energy, the operation of networks and the sale of energy have traditionally been the business of big corporations. Nevertheless, there are also many regional network operators such as local utility companies and energy cooperatives. Some of these cooperatives are over 100 years old, and demonstrate that the supply of energy by residents for residents is also possible in the long term and on a large scale. This is especially interesting against the backdrop of the current de-privatisation of electricity networks.

“We expect energy to be available. You don’t think about power when you switch on your toaster, vacuum cleaner, or television”, says Hubert Rinklin, managing director of Alb-Elektrizitätswerke Geislingen-Steige eG. We owe our electrical household appliances, public transport, and the heating in our homes to a guaranteed and affordable supply of energy. This was not always the case: early in the twentieth century the comprehensive supply of rural areas with electricity was inconceivable. The rural population had to act themselves and secured their own electricity supply. Local utility companies and cooperatives were established – as in Geislingen an der Steige in Baden-Württemberg. Since 1910, AlbWerk has been supplying the region with electricity. “At the beginning it was all about creating an energy network. Wooden poles with cables were erected to allow people to use the first electric light bulbs in their homes”, explains the managing director of the cooperative.

Managing your own energy
The electricity that was initially produced was hydroelectric. Cereal mills formed the nucleus of the cooperative, feeding unused electricity into the electricity network. Later on, coal-fired power plants were built. Nowadays, renewables such as wind, biomass, and solar power play a major role at AlbWerk. The cooperative's core business has hardly changed since the early days. “Ninety percent of our business is now, as then, the supply of electricity”, confirms Rinklin. In addition to supplying electricity, operating networks, and selling electricity, the cooperative is active as an electrical and communications technology service provider, while also retailing electrical equipment. The question as to who should operate the local energy network is currently being posed by many. According to the Association of Local Utilities (VKU), most of the electricity and gas distribution concessionary contracts are due to run out nationwide in 2015/16. Generally, these concessions are granted for 20 years. Many authorities are now assessing the option of assuming local control of their distribution networks. To do so, they generally rely on the assistance on an established energy provider. In Geislingen and the surrounding area, electricity generation and sales have been in the hands of the residents for over one hundred years. The 1,300 or so members of the energy cooperative are mostly families based in the area. AlbWerk has deep roots: “Our shares aren’t sold, they’re handed down from generation to generation”, states Rinklin. “We supply 93 percent of the households. In turn, the money generated is spent here in the region. Profits don’t end up in company headquarters, but are distributed among the members”, explains the chairman of the cooperative. “Knowing us to be responsible partners, the local authorities trust us with the energy supply.”

Local added value
By operating their own energy companies, local communities enjoy a lot of advantages: network distribution profits no longer pass to a third party, but into their own funds. In addition there’s the additional income in trade tax. Community-operated energy supply companies are major local employers and generally give any tenders to local tradesmen. In addition, the communities themselves get to decide on and to implement environmental targets. Taking over the operation of the network is often just the start, which in turn leads to further activities
such as the sale of energy or getting into renewables. The primary aim is local added value – from the generation process through to sales. The de-privatisation of an electricity network requires however a huge level of financial investment and above all specialist expertise. But most initiators lack the necessary skills and financial wherewithal. “De-privatisation is not something a community can really achieve from a standing start. The founding of a “green field” energy supply company is rare. Such projects usually succeed if the water and heat supply is already under local authority control. At least you can then count on the necessary commercial expertise”, continues Rinklin. De-privatisation is therefore a lengthy process and very demanding – legally, technically and commercially. The process generally takes three years. At the outset, the different options need to be assessed. Should cooperation with the previous network owner be extended, or is a different solution needed? One possibility, for instance, can be the purchase of the network by the local authority with the aim of leasing it to a third party. Another solution: to found a joint network company with the previous network operator or with a new one. Or to set up a new public utility company – at a parish, municipal or regional level.

**Experienced partners provide security**

Having set the fundamental course, information about the network is acquired from the previous owner in order to assess it on that basis. You then need to address the de-bundling of the network. And of course the right partners need to be found. The final decision on the project is made by the parish council. Should the proposal be approved, the company and its commercial and technical infrastructure in particular need to be built up. Price negotiations with the previous network operator are likely to be the hardest part of the process, and in fact these negotiations are extremely risky; after all, the amortisation of the purchase price takes longer due to continually sinking revenues – as a result of so-called incentive-based regulation. And then there is the shrinking population in many regions. De-bundling the network also usually involves considerable and hard-to-calculate costs. Experienced partners are vital when planning de-privatisation: “We’re known throughout southern Germany for our expertise in this field. We gladly put our knowledge and our staff at the disposal of individual projects. This gives us the opportunity to grow”, reveals Rinklin. Growth and the expansion of regional energy concepts are more than just a business matter, they’re a mission too: “The regional philosophy is as important to us as being in the black when it comes to profit and loss.” For instance, AlbWerk founded the Waldkirch municipal utility company in 1998, and the Bodensee regional utility company in 2008, with the latter involving investment from seven towns and villages. In the opinion of the AlbWerk boss, regional structures will dominate the future of the energy market: local energy production based on renewables, regional energy networks and sales structures. In future there will be more experts in regional energy, and their task will be to assure a responsible energy supply for the local population. Accordingly, energy supply in the final analysis means reaching the people on the ground. The cooperative legal form has been offering the ideal solution to do so for years.