

Community Power: enabling legislation to increase community ownership for RES projects
across Europe

Project No: IEE/12/991



***Community energy in Germany:
existing models, public-private funding
and good practice examples***

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1 Introduction

The energy sector in Germany is in transition towards a 'green economy'. Energy transition is referred to as 'Energiewende' and it means the realisation of sustainable energy supply in electricity, heat and mobility sectors by renewable energy production. This includes wind, solar (solar thermal and photovoltaic), bioenergy, hydro, ocean and geothermal energy.

The energy transition is driven by environmental and social problems associated with the use of fossil fuels. The reduction of CO₂ emissions and the replacement of fossil fuels as well as the phase-out of nuclear energy are the core objectives of the 'Energiewende' in Germany. In addition, increase of energy efficiency, reduction of energy consumption and liberalisation of production and distribution structures are important elements of the energy transition.

In Germany 27% of all electricity comes from renewable energies and over 65% of the wind turbines and solar panels are owned by individuals, farmers and communities. The liberalization of energy production enables citizens to be directly involved in energy production through different participation models, such as community energy cooperatives, community wind farms and solar parks. Solar thermal and photovoltaic systems (PV) can be easily operated by individual consumers, therefore solar panels are often built on the roofs of private households. The decentralised production of renewable energy enables to create an additional value on the local level and strengthen rural areas. Therefore, renewable energy plays an increasingly important role in local energy policies.

In general, participation in community energy can be defined as an active involvement of citizens and social actors, such as community cooperatives, in renewable energy production (bottom-up approach), or as a passive involvement of citizens through buying some shares from other actors owning a renewable energy production facility (top-down approach).

The CO-POWER project aims to enable legislation in order to increase community ownership for RES projects across Europe. The project carries out activities in 7 European countries - Czech Republic, Denmark, Spain, Hungary, Ireland and UK - and creates a platform for knowledge exchange and transfer among different countries.

This report was elaborated in the framework of the CO-POWER project and provides an overview on existing ownership models, mobilisation of public-private funding and good practice examples in Germany.



Figure 1: Windpark Ellhoeft, Germany (Source: www.windpark-ellhoeft.de)

2 Overview on community energy models

2.1 Participating actors in community energy

In addition to companies and municipalities, private households and communities are increasingly involved in the production of renewable energy sources. Therefore, decentralized individual or community-based solutions are gaining more attention in Germany. Citizen participation in the energy production contributes significantly to the public acceptance of economic and ecologic renewable energy production.

The expansion of renewable energies in the power sector was determined by the introduction of the feed-in-tariffs in 1991 and their further expansion. Due to favourable legal conditions in Germany, citizen-led renewable energy installations are widespread, particularly in relation to wind and solar energy. Rather than being a purely social movement, the push of citizens for renewable energy in Germany can be characterised as profit-driven (Bolinger 2001). Citizens are particularly interested in making investments that are financially advantageous.

Community energy projects are not only about investments and profits, but also about strengthening democratic structures by involving citizens in energy production. However, renewable energy production from private households has limited capacities. For example, there might be no own roof space for the installation of a PV system or the project can exceed own financial resources. By merging of capital, know-how and time capacities, it is possible to install a larger PV system in the community on rented roofs or even to implement a windmill, hydro power plant or biomass project. Often a small financial contribution is sufficient to participate in community investment activities. Such projects often have a regional aspect: involved citizens are from the same region, and a renewable energy facility is also built in the region. Citizens establish a company and are the co-owners of the company. They also have co-determination (Mitbestimmung) and control rights.

In Germany, the main groups of actors in community energy are citizens' energy companies (Bürgerenergiegesellschaften), individual owners and energy suppliers. The particular legal form of company should be well considered before launching a project as it defines different basis for cooperation of partners, participation and control. Citizens' energy companies mainly include energy cooperatives, profit participation of employees or customers, community projects by a small group of local investors (Gemeinschaftsanlagen), joint local investments by citizens and municipal authorities. In general, citizens' energy companies have local investors in the region where the facility is located and the participation of community or citizens is quite high (up to 50% of the the equity of the company). Individual owner groups contain private individuals as well as agricultural sole proprietorships (Einzelunternehmen), partnerships (Personengesellschaft) and small corporations (Kapitalgesellschaft) (e.g. agricultural cooperatives).

Besides the big energy utilities, in Germany also local authorities are engaged in the supply, production, and distribution of energy via municipal utilities (Stadtwerke). Municipal utilities are owned either by the municipality, or by a private company. For example, the Stadtwerke München GmbH (Munich City Utilities, SWM) is a communal company which offers public services for the city and the region of Munich. It is 100% owned by the city of Munich. From 2008 until 2025, SWM plans to invest up to 9 billion Euros for renewable energies.

The choice of the legal form influences the work involved in the creation of a company and during the operation of the plant. A later change of the legal form is costly and time consuming, therefore the most appropriate form should be well considered in the beginning of the project.

There are projects financed by citizens where citizens are not co-owners of the facility and do not take part in management board. Depending on the form of participation, citizens invest their money in renewable energy facility as an investment product. In this case the investment goes directly to a project operator or to a financial institution and the citizens only co-finance a facility.

2.2 Legal entity forms of community energy projects

Civil Law Partnership - GbR

The selection of appropriate legal form is important for the realisation of each citizen's energy project. The fastest, easiest and cheapest option is the establishment of a civil law corporation (GbR, Gesellschaft bürgerlichen Rechts). This legal form is very popular among solar energy plants owned by citizens. The company receives a feed-in tariff for the generated electricity fed into the grid. After deducting costs for insurance, maintenance, capital reserves and other costs, the surplus is proportionately distributed to all GbR partners. Normally the distribution of surplus is specified in the partnership agreement.

The GbR has no legal personality, therefore it does not bear any rights and duties itself. Instead, the rights and duties affect the individual partners personally. This is the biggest disadvantage of this legal form as the shareholders are fully and legally liable with their private assets. For this reason it is important to estimate the risk carefully, e.g. by having an experienced installer and an appropriate insurance.

In order to reduce the risk, it is possible to combine GbR with the establishment of a registered union (Verein). The GbR will remain the owner of the renewable energy system and recipient of the feed-in tariff. However, in the service contract the union will be entrusted to establish and operate the plant as well as accept the related liability. This legal form is particularly interesting for smaller projects with an investment of a few hundred thousand euros. However, the risks should be always carefully weighed against opportunities.

Limited partnership - GmbH & Co. KG

Usually community energy projects are associated with small-scale projects. However, communities successfully own also large energy systems of photovoltaics, wind power, biomass etc. With increasing investment (close to one million euros) the projects are often complex and business risks increase, therefore a full-time management is necessary. Such conditions require a legal form which on the one hand limits the liability of involved parties and on the other hand facilitates the integration of numerous investors. This is offered by GmbH & Co KG legal form, which is a mixed form of limited partnership (Kommanditgesellschaft, KG) and private limited company (Gesellschaft mit beschränkter Haftung, GmbH). Many citizens can provide capital as limited partners. The liability of the limited partners (Kommanditisten) is restricted to their respective share of the partnership capital. Depending on the success of the project, limited partners get a return. However, there is also a risk of capital loss. The GmbH shareholders are usually the initiators of the project and are responsible for management issue.

GmbH & Co. KG legal form requires a significantly high star-up and is related to administrative burdens. Therefore, this legal form is suitable for bigger projects, where a connection of groups with different motivation can be brought together, namely investors and business managers.

Registered cooperative society - eG

Registered cooperative (eingetragene Genossenschaft, eG) can be an alternative to GmbH & Co. KG. By the end of 2013 there were around 900 energy cooperatives in Germany (Figure 2). This legal form is subject to the Cooperatives Act (Genossenschaftsgesetz, GenG). It is considered to be a democratic form as each member has usually one vote, regardless of the amount of the capital contribution. As in the case of GmbH & Co. KG, in eG the liability of partners is limited to their capital contribution.

The Association of Cooperatives carefully checks the business plan and the statute of the cooperative before it can be registered in the register of cooperatives. Due to such checks this legal form is considered as the most insolvency-proof legal form in Germany. The members of cooperative get dividend payments from the annual surplus.

A key feature of energy cooperatives is that they are 100% owned by their members and not by investors like conventional companies. The main objective of a cooperative is to support community work and deliver services to its members. Therefore, cooperatives are not

charitable and their main goals have nothing to do with the distribution of profits based on level of investment.

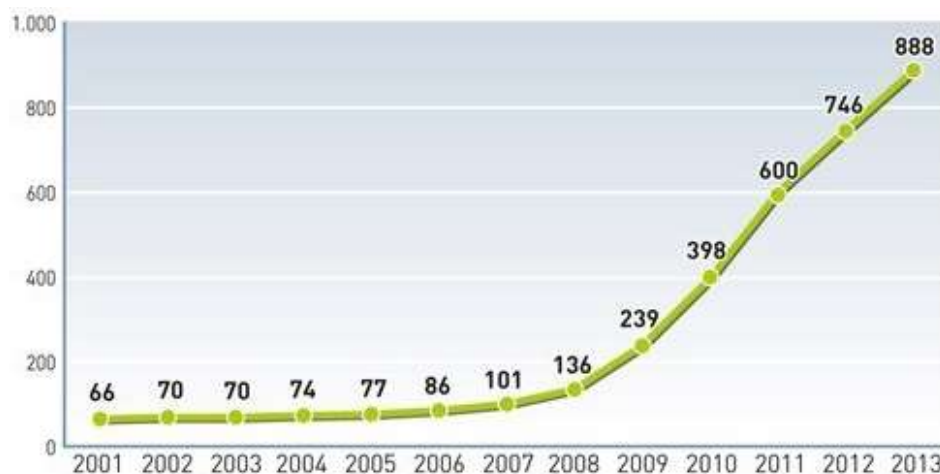


Figure 2: The development of energy cooperatives in Germany (Source: Klaus Novy Institute, 2014; www.unendlich-viel-energie.de)

Table 1 provides an overview on different legal models for community energy projects.

Table 1: Overview on different legal forms of the active financial participation

Legal form	GbR	GmbH & Co. KG	e.G
Foundation	easy; at least 2 members; no entry in a register; informal contract sufficient	complex; at least 2 shareholders; partnership agreements needed; entry in the commercial register	complex; at least 3 members; inspection of business plan and statutes; entry in the register of cooperatives
Administrative burden	low	high	high
Liability	unlimited	limited	limited
Decision making rights	many	many for GmbH shareholders few for KG shareholders	medium
Minimum capital	no minimum investment	for GmbH shareholders - 25,00 EUR for KG shareholders - no minimum investment	at least one share per member; no fixed start capital

Other legal forms

Limited partnership (KG) is another useful legal structure for small projects. It is an alternative to GbR when shareholders want to combine different interests: investors and persons who take over the management and are willing to be personally liable. It requires a higher start-up and administrative costs are higher than in GbR form. A company has to be registered in the commercial register and annual financial statements must be elaborated. *Limited liability company (GmbH)* can be also considered for small projects. If a shareholder decides to exit, the shares are sold or inherited. The minimum required capital is 25,000 EUR. *Limited company (Aktiengesellschaft, AG)* is suitable for large investment volumes, as a minimum share capital amounts to 50,000 EUR. *Institution under Public Law (AöR)* is a legal form which can be chosen for projects driven by municipalities. One of the first municipalities that founded AöR for the construction and operation of renewable energy systems was the association of municipalities in Arzfeld. Islek Energie AöR was established in order to develop renewable energies as a new economic activity and implement projects on municipal level.

Other legal forms are interesting if citizens want to implement campaigns in addition to RES (Renewable Energy Sources) production. Non-profit organisations are registered as associations, non-profit private limited companies (gemeinnützige GmbH) or foundations.

2.3 Financing options of community energy projects

The financial participation in community energy projects brings profits of the project to citizens, however it is also related to entrepreneurial risks. Therefore, careful planning, risk minimisation through insurance and professional installers and operators are essential for the success of community owned projects. Table 2 shows different forms of citizens' financial participation in community energy projects.

Table 2: Forms of citizens' financial participation in community energy projects (Source: EnergieAgentur.NRW 2014)

Financial citizens' participation			
Active financial participation		Passive financial participation	
Production	Financing	Citizens	Communities
- GbR	- Silent participation	- Rented areas	- A group of citizens/ community foundation
- GmbH & Co. KG	- Subordinated loans	- Resident's premium	- Municipalities as operators
- eG	- Profit participation rights	- Direct marketing of electricity/heat	- Other forms
- Other forms	- Collateralised Debt Obligation (CDO)	- Other forms	
	- Savings certificates		
	- Other forms		

Bearer bonds (Inhaberschuldverschreibungen)

One of the options to integrate citizens' capital in the production of renewable energies is to issue the bearer bonds (debt security). It can be issued by a business entity, or by a government. For example, a public utility (Stadtwerke) can issue bearer bonds in order to finance renewable energy projects. It is committed to the signatories of the bear bonds to pay back the amount subscribed at the end of the agreed term, including the agreed interest rate. The signatories have no voting rights at the management board and no right to information about the financial situation of the company. The payments depend on the overall financial situation of the company. The agreed fixed interest rate provides predictable returns, however the opportunities and risks should be considered very carefully. The certificate of beared bonds should be stored carefully because it certifies the repayment of amount subscribed.

Refurbishment projects - energy efficient buildings

In Germany, the largest potential for saving energy is in the housing stock. About 85% of total energy demand in private households is used for heating rooms and for hot water. Through refurbishment projects and the use of modern building techniques, energy demand can be reduced by up to 20% (DENA). All participants benefit from energy-efficient building and modernisation: tenants and landlords, private companies, the environment and the economy.

Associations of apartment owners (Wohnungseigentümergeinschaften) can be also involved in refurbishment projects in order to save energy consumption. However, the participation of citizens in the refurbishment of municipal buildings is very rare. This idea was turned into a pilot project in North Rhine-Westphalia. Energy saving measures were combined with the installation of photovoltaic systems in different schools. Citizens could co-finance the project via company executing the work (stille Beteiligung). A limited liability company GmbH & Co. KG was established for each school. The company entered into a contracting agreement with the owner of the building (municipality) in which they committed to implement energy saving measures for the school. In return, the GmbH & Co. KG receives a share of the energy cost savings (energy performance contracting). In addition, the school rented its roof for the installation of a photovoltaic system. The school benefits from the roof rent and a share of the energy saving costs. More information about the project can be found at <http://www.wupperinst.org/solarundspar>.

Subordinated loans (Nachrangdarlehen)

Another possibility for citizens to participate financially in the energy transition is granting subordinated loans to companies. Public utilities (Stadtwerke) offer such possibilities to their customers. In case a public utility bankrupts, all other creditors retain their money before subordinated loans are repaid. Therefore, there is an increased risk for loss of capital for citizens, which is compensated with attractive interest rates.

Crowdfunding investments

Crowdfunding investments are also subordinated loans which are a very popular form of investment. Such platforms are used for collecting capital for investment on the internet. Recently, crowdfunding companies were established for investments in renewable energy or energy efficiency.

In Germany, there are four different crowdfunding forms: reward-based, donation-based, equity-based and lending-based crowdfunding. The rewards and donation models are often used to finance social and non-profit projects usually implemented by NGOs. These models contain no financial return. The equity model is applied when individuals make investments in return for a share in the profits or revenue generated by the project. The lending model offers individuals to lend money to a company or project in return for repayment of the loan with interest rate.

Profit participation rights (Genussrechte)

Profit participation rights are obligation law contracts where the investor (e.g. citizen) provides a certain amount of capital to a company and in return gets usually a fixed interest rate as well as a profit and loss sharing agreement. This means that the investor participates in profits and losses of the company. The owner of the participation rights is not a shareholder of the company, therefore he is usually not entitled to membership rights (it is not possible to have voting rights in the company's shareholders' meeting and to attend these meetings). Participation certificates are not defined by law and are negotiated by the parties. It is also possible to agree on minimum interest payments which are independent from the profits of the company. Profit participation rights certified as securities are called profit participation certificates (Genussscheinen). In the event of insolvency all other creditors retain their money before the owner of the profit participation rights.

Savings bonds (Sparbriefe)

At the moment many banks in Germany offer products which integrate environmental and climate protection aspects. The bank which offers savings bonds does not invest itself in renewable energy project. However it gives financing loans to their customers who are usually based in the region and aim to implement a renewable energy project. In return, the investor receives a usual bank product which is protected through deposit insurance. The interest rate is fixed, therefore the investor benefits of predictable stable return.

3 Good practise examples of community energy projects

3.1 Jühnde bioenergy village

Jühnde village located in Lower Saxony is the first village in Germany to produce heat and electricity from biomass resources, thus creating a CO₂ neutral balance. The biomass is used flexibly in order to meet the changing demands of heat and electricity.

It took around 5 years to implement the whole project in the village. It was crucial to have competent local experts willing to provide transparent information on the project including the challenges and problems of the project. Many information campaigns through village gatherings and information letters were implemented in order to convince the local community to join the project. The bioenergy village was established thanks to engaged local community and municipality.



Figure 3: (Jühnde bioenergy village, FNR/Jan Zappner; www.bioenergiedorf.de)

The bioenergy village has its own biogas plant, wood chip boiler, decentralized heating grid and photovoltaic system. The local farmers provide around 17,000 tons of biomass (manure, crop silage, maize and sunflowers) for the biogas plant. The digestate from the biogas plants is brought back to the fields as a high quality fertilizer.

The biogas plant has a 700 kW_{el} CHP (combined heat and power) unit generating around 5 million kWh of electricity which is fed into the grid. The district heating network of 5.5 km was laid in order to provide heat to 140 households (app. 70% of all households in Jühnde). Around 4.5 million kWh of heat are fed into the district heating network. In winter the peak loads are covered by a wood chip boiler which has 550 kWh_{th} installed capacity.

Jühnde bioenergy village invested around 5.3 million EUR into the project implementation. FNR (Fachagentur Nachwachsende Rohstoffe e.V.) took over the financing of the research activities and covered a part of investment costs for the district heating network with 1.3 million EUR. The planning and the authorization phase was supported with 55,000 EUR from LEADER+ programme. Finally, the State of Lower Saxony and the district of Göttingen supported the project with 100,000 EUR.

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3.2 Solar community energy project in Recklinghausen

There are many public roof surfaces in cities which can be easily used for the generation of electricity and heat. The citizens of Recklinghausen decided to exploit this potential with a community power project. The initiators of the project wanted to give the city an opportunity to get involved in a renewable energy sources project and make a positive contribution to the environmental protection. Since July 2011, the citizens of Recklinghäuser feed the electricity from three PV systems into the power grid. The plant produces around 195,000 kWh of electricity per year. This amount of energy is enough to supply around 60 households with electricity the whole year.



Figure 4: Sola-Re PV installation (Source: www.sola-re.de)

The city of Recklinghausen supports the initiative by the lease of the roof surfaces for the PV cells. The mayor of the city also personally invested into the project.

Investment costs of the project were 220,000-260,000 EUR. Citizens could participate in the project with the minimum investment of 500 EUR. The average investment amount was 3,300 EUR. The project was 100% financed with own capital resources.

In total three GbRs (Gesellschaft bürgerlichen Rechts) were established in order to run the project. In addition, a union (Verein) SolaRE e.V. was established. The association is responsible for the construction and operation of the PV systems and three GbRs containing 70-80 citizens each are financing and using the solar systems (Figure 4).

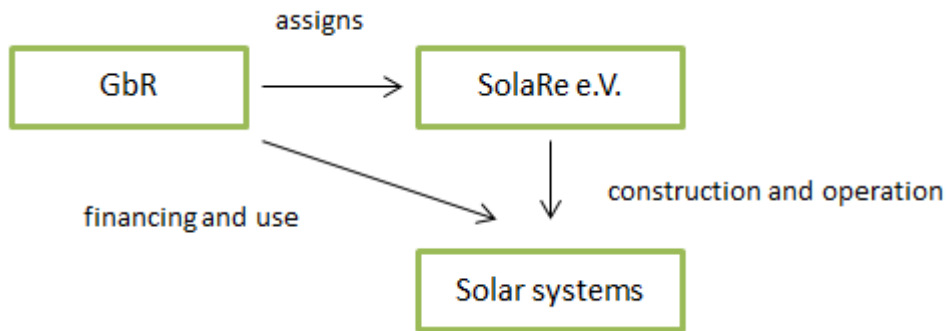


Figure 5: Legal assignments of GbR and union

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3.3 Rothaarwind community wind park

Rothaarwind community energy wind park is located near Hilchenbach and contains five wind power turbines of 10 MW installed power. The planning phase of the wind park took more than six years due to nature conservation issues. During the long planning phase the project was supported by the city of Hilchenbach. This was an important factor for the success of the project.

The wind park generates 4.5 million kWh of electricity which is enough for more than 5,000 families per year. The legal form of the operating company is GmbH & Co. KG and it contains 87 citizens-shareholders as well as the city of Hilchenbach. Investment costs of the project were 15.5 million EUR.



Figure 6: Wind park Rothaarwind (Source: www.rothaarwind.de)

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4 Conclusions

Germany is a good example of how national energy targets can lead to local actions towards renewable energy production. The German energy transition is mainly driven by citizens and communities. Citizens increasingly support renewable energy and many of them want to produce it themselves. The bottom-up approach is expressed by taking back grids in public hands, founding energy cooperatives, as well as establishing concepts of regional energy autonomy based on renewables and energy saving.

The switch to renewable energies strengthens small and medium-sized business. In addition, it empowers local communities and citizens to generate decentralized renewable energy. In this way communities are benefiting from new jobs and environmental advantages.

However, community energy in Germany faces also challenges. Although the energy transition in Germany covers the areas of electricity, heat and transport, the focus in Germany is mainly on electricity production. This is due to the reason that the electricity sector is much more present on the energy policy agenda. Therefore, community energy projects in heating and cooling sectors as well as in energy efficient buildings should be promoted and supported.

Many community energy projects still generate a low economic return. Therefore, it is important to ensure that these projects can operate profitably. Smaller PV projects can be easily financed with own capital, however if we talk about larger projects, the availability of capital is still a challenge.

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