

Mitigation Enabling Energy Transition in the MEDiterranean region



Energy Communities – net metering- virtual metering

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In general...

Renewable energy communities involve:

- ✓ groups of citizens,
- ✓ social entrepreneurs,
- ✓ public authorities
- ✓ community organisations

participating *directly in the energy transition* by jointly:

- ✓ investing in,
- ✓ producing,
- ✓ selling
- ✓ distributing renewable energy.

In general...

- Renewable energy communities involve generation of energy from **renewable resources and technologies**, which are partly or wholly **owned by local communities**.
- The definition is **flexible**, recognizing that different legal and economic models abound, and that depending on the local context, numerous actors may be involved, **including citizens, local businesses, charities and the public sector**.
- Has the legal form of a **civil partnership of exclusive purpose**, having as partners both citizens and enterprises with residence or facilities within the same region.

Main goals

- To promote social economy values
- To promote innovative energy solutions
- To benefit from the local or regional production, distribution and exchange energy from RES
- To strengthen the decentralized growth model
- To become self-sufficient and autonomous
- To create Netprosumers: citizens, social organizations, local or city authorities, small and medium-sized local businesses can take part in energy projects as producers and consumers at the same time

General Benefits

- ✓ Reduction of greenhouse gas emissions
- ✓ Increased social acceptance of renewable energies
- ✓ Involvement of Communities in decision-making
- ✓ Direct benefits from the projects locally

Benefits...

...For the communities involved:

- ✓ economic development,
- ✓ the creation of new jobs,
- ✓ cheaper energy,
- ✓ self-sufficiency,
- ✓ community cohesion
- ✓ energy security.

Regional authorities can support the emergence of energy communities by providing financing, expertise and advice, and ensuring that regulatory issues can be easily understood and navigated.

Also, if they play a role in the community, or mandate a community to supply energy, then they can benefit from cheaper energy for public utilities, such as street lighting, and savings can be refocused on those at risk of energy poverty, or on other regional priorities.

Challenges

- ✓ Availability of leadership
- ✓ Availability of skills and finance
- ✓ The role of regulation
- ✓ The existing energy market
- ✓ Cultural issues

Challenges: Leadership

As a first step to building a community energy system, those who are interested need to be gathered and coordinated to build a legal, administrative and management structure.

Many models are available, and a full awareness of regional resources is required.

This task requires **clear leadership and financial and legal knowledge.**

Without political motivation and direction from a public authority, it can be difficult for an individual to step up to a leadership role.

Challenges: Financing

Renewable energy projects typically require significant up-front investment, whilst operation and maintenance costs are low in the long run.

If it is not possible to raise these investments from those interested in building the community, then **external financing** is required.

Many banks and financial intermediaries have low awareness of community energy structures, and convincing them of the business case for investment can be **challenging**.

Many lenders refuse to provide debt to co-operatives altogether.

Challenges: Regulation

Regulatory issues, including **land management** and **planning laws**, can be major barriers to community energy development.

Local actors should have or develop the capacity to independently handle the **bureaucratic** requirements.

Other barriers could be related to **permits** and **environmental impact assessments** that the Communities are not equipped to overcome.

Challenges: existing energy market

Communities can face challenges in **entering the energy market**, gaining access to grids and competing on a fair basis with energy utilities.

Distribution system operators may not recognize a community energy structure as a supplier, or may prioritize energy from other resources.

Challenges: cultural issues

- ✓ How does the local community reacts to common ownership?
- ✓ Countries such as Germany and the Netherlands have long traditions of co-operative ownership and decision-making, partly explaining their success in community energy.
- ✓ Citizens how are not familiar to this model may have greater **resistance** to community or co-operative schemes which some consider to resemble collective ownership

Models

- ✓ The flexibility in the definition and form of an Energy Community can help to overcome the above mentioned challenges
- ✓ Various models have been developed and functioned since the first Community, adopting to the special needs, driving forces and the willingness of the local stakeholders and individuals
- ✓ The overall mission and objectives of the endeavor will also influence organisational strategy, structure and activities, as well as financing

Models

Typical business models can include:

- ✓ co-operatives
- ✓ charities
- ✓ development trusts
- ✓ businesses with community-only shareholders

The model of the Community be determined by the stakeholders involved, resource availability and community demand.

The Community f.i. can be run on a not-for-profit basis to provide cheap, or discounted, energy for a marginalised or rural community, or can be run as a profit-making enterprise to bring additional income to an area.

Models: Example 1

Island of Eigg, Scotland, UK

- ✓ The project was supported by the charity Community Energy Scotland
- ✓ The island was not connected to the UK's electricity grid
- ✓ The aim of the charity was to ensure a steady, clean energy supply for the island's fifty inhabitants
- ✓ The project has installed solar, wind and hydropower, generating nearly 100% of the island's energy needs.

Alternately, a community energy scheme may be established by a group of local entrepreneurs looking to diversify their income whilst benefitting the community.

Models: Example 2

Eno, Joensuu, Finland

In this case, a group of local entrepreneurs looking to diversify their income whilst benefitting the community, formed *Eno Energy Co-operative*

- ✓ 12 local forest owners joined together to provide heat to public buildings using locally available biomass.
- ✓ The co-operative has grown now to fifty-five forest owners, who own and operate three district heating plants with a distribution network of around 11 kilometres.
- ✓ The members of the co-operative can provide the heating network with around 30% of its wood fuel requirements, with the remainder sourced from other local suppliers.
- ✓ Over fifteen years, customers have saved over four million Euros compared to fossil fuels, whilst creating the equivalent of ten full time jobs and diversifying income for forest owners.
- ✓ In total, it is estimated that the co-operative provides economic benefits to the region of around 2 million Euros per year.

Models: Example 3

Rabat region, Malta

Solar Photovoltaic Communal Farm Scheme: Investments into public infrastructure can be open to all people within a community. The scheme was established by the Maltese Energy and Water Agency to boost RE generation on the island (reach targets).

The roof of the Tal-Fiddien Reservoir has been converted into a solar PV farm that invites investments from citizens who may not be able to invest in solar PV in their own properties as they lack a suitable surface (such as in a ground floor apartment).

The installation contains 4,000 PV panels totalling 999 kWp (kilowatt peak – the electricity production of a PV system when at maximum capacity).

Residents can purchase between 1-3 kWp at a price of EUR 1,500 per kWp and in return they benefit from a feed-in tariff of 15 cents per kWh generated for the first 6 years, and 10.5 cents for the remainder of the 20 year lease.

Despite an initially slow start, the scheme has been very successful, with all 999 kWp purchased within nine months of the launch, by around 400 households.

Legal forms

- Co-operative
- Partnership
- Trusts and foundations
- Public utility company
- Public-private partnership

Legal forms: Co-operative

- Co-operative societies are intended to primarily benefit their members.
- Membership is voluntary and open to anyone willing to accept responsibilities and risks.
- Members benefit from generated energy, and have a say in governance and profit allocation with one vote per member.
- They may provide training and other benefits to members, as required to maintain the co-operative.

Legal forms: Partnership

- Individuals decide to work together to establish a legal partnership with the aim of providing energy to a community.
- Unlike a co-operative, voting power will be determined by the stake that each individual puts into the company.
- As well as providing a community benefit, partnerships can generate a profit.

Legal forms: Trusts and foundations

- Are established as charitable organisations, with the aim of delivering a social benefit rather than profit.
- These forms enable whole communities to benefit, even when individuals cannot afford to participate.

Legal forms: Public utility company

- Are run by municipalities, who invest in and manage the utility on behalf of taxpayers and citizens.
- These forms are less common, but are particularly suited for rural or isolated areas.

Legal forms: Public-private partnership

- Local authorities can decide to enter into agreements with citizen groups and businesses in order to ensure energy provision and other benefits for a community.

Technical options

- ✓ Community energy projects can involve renewable energy generation technologies alone, feeding into existing grids and networks, or can include community run management and ownership of distribution infrastructure, such as local smart grids, or heating networks.
- ✓ On the generation side, community energy schemes can use any of a number of technologies, with solar, wind or biomass sources being the most frequently used.
- ✓ Examples also exist of community run small hydropower plants, which have often involved restoring abandoned infrastructure and bringing it to modern environmental and safety standards.

Technical options

- ✓ Renewable energy projects can vary in scale, and larger scale installations require larger management and maintenance capacity.
- ✓ Larger systems will also require greater capital investment, but once investment is recovered, benefits are higher, and money saved (or even earned) through community energy can be reinvested in new community programmes and infrastructure.
- ✓ It is rarer for a community to run a utility-scale project, which are significantly more complicated and need greater expertise and capital investment. In particular, utility-scale projects will face tougher environmental and planning barriers.

Recommendations

- ✓ Awareness
- ✓ Finance
- ✓ Expertise and Guidance
- ✓ Legal frameworks and regulation

Awareness

- ✓ Regional policy-makers can **communicate the benefits** of community energy, highlighting not only the economic benefits for those who get involved, but also the broader societal and regional challenges that could be overcome such as energy poverty, energy scarcity and unemployment.
- ✓ Regions can help to kick-start the process of community energy development by performing a regional assessment of RE source **availability** and demonstrating that there is potential **return on investment**. The assessment should also include a mapping of relevant stakeholders and those with technical and legal capacity to assist in community energy development.
- ✓ Public authorities can mandate their energy agencies or other suitable players to **create a platform** that can gather citizens to inform them about community energy, and enable discussion.

Finance

- ✓ Financial support – such as project development grants or low-interest loans – should be provided to groups who are interested in building community projects to enable them to perform feasibility studies and access consultancy services.
- ✓ A key driving force behind the emergence of energy communities in Germany has been access to the country's Feed in Tariff (FiT), guaranteeing a minimum purchasing price for energy from renewable resources. Energy communities should be explicitly supported in existing support schemes, with minimum barriers to involvement.
- ✓ Although it may not be possible at a municipal level, investment and tax relief can be granted to community energy projects. Relief can also be applied to charges on consumption of energy.
- ✓ Public procurement can be used to support community energy development. Tenders for energy infrastructure can apply a minimum requirement for community ownership of shares, and regions could preference community-run models for provision of energy to public buildings and infrastructure, such as street lighting or district heating.

Expertise and Guidance

- ✓ Regional authorities can organise workshops and educational efforts to build capacity for the creation of community energy organisations, and can support the training of individuals for managing and maintaining renewable energy technologies;
- ✓ Authorities can also ensure that expertise is available when needed by community developers, by providing an information point dedicated to community energy development. This can be done in house, or through development of independent organisations such as Community Energy England and Community Energy Scotland;
- ✓ Local government departments should be available to help community energy planners with regulatory issues such as land use planning, permitting and environmental regulation;
- ✓ Authorities can designate public infrastructure, such as large roofs, closed landfills, dam faces, or reservoir tops for renewable energy community development, as was done at Malta's Tal-Fiddien Reservoir.

Legal frameworks and regulation

- ✓ Local authorities can require a minimum level of community involvement in energy infrastructures by amending planning regulations.
- ✓ Energy strategies should be amended to include targets for community energy, indicating long-term commitment. Strategies should define community energy, but avoid overly-limiting definitions that would prevent all possible legal forms from being used.
- ✓ National governments need to take stock of the possible legal forms available in their countries for establishing energy communities, and ensure that there are no unnecessary barriers.
- ✓ National and regional governments should explore current barriers to community energy structures, particularly in relation to grid integration.

Net metering

- ✓ Net metering is a regulatory framework under which the excess electricity injected into the grid can be used at a later time to offset consumption during times when their onsite RE generation is not sufficient or absent.
- ✓ Consumers use the grid as a back up system for their excess power production.
- ✓ The billing period can extend from one hour to one billing period or one year.
- ✓ Net metering are effective to jump-start distributed generation markets (esp USA and Australia, as well as EU) and it is attractive, easy to apply and to understand to the consumers: one single meter is used.
- ✓ It raises concerns to the system when large deployment levels are reached.

Virtual metering

- Virtual net metering links fragmented and scattered operations, such as farmer plots, to just one electricity power meter to offset the cost of electricity supplied by the power utility with electricity produced through PV self-production for the grid.
- Vocational groups such as farmers whose operations are spread over scattered plots of land stand to benefit from virtual net metering.

ESCO

An ESCO is a company that offers energy services which may include implementing energy-efficiency projects (and also renewable energy projects) and in many case on a turn-key basis. The three main characteristics of an ESCO are:

- ESCOs guarantee energy savings and/or provision of the same level of energy service at lower cost. A performance guarantee can take several forms. It can revolve around the actual flow of energy savings from a project, can stipulate that the energy savings will be sufficient to repay monthly debt service costs, or that the same level of energy service is provided for less money.
- The remuneration of ESCOs is directly tied to the energy savings achieved.
- ESCOs can finance, or assist in arranging financing for the operation of an energy system by providing a savings guarantee.

REScoop

REScoop.eu is the European federation of renewable energy cooperatives:

- is short for renewable energy cooperative, and refers to a business model where citizens jointly own and participate in renewable energy or energy efficiency projects.
- also refers to a community of power or community of energy initiatives.
- does not necessarily have the legal statute of a cooperative, but rather distinguish by the way they do business.
- Is a growing network of 1,500 European energy cooperatives and their 1.000.000 citizens who are active in the energy transition

REScoop

Typical 7 principles:

- *Voluntary and Open Membership*
- *Democratic Member Control*
- *Economic Participation through Direct Ownership*
- *Autonomy and Independence*
- *Education, Training and Information*
- *Cooperation among Cooperatives*
- *Concern for Community*

All citizens are eligible to join a REScoop. After purchasing a cooperative share and becoming a member or co-owner of local RES and EE projects, members share in the profits and often are given the opportunity to buy the electricity at a fair price.

In addition, Members can actively participate in the cooperative: they can decide in what and where the REScoop should invest, and are consulted when setting the energy price.

REScoop advantages

Fosters social acceptance for renewable energy

- Local opposition to renewable energy projects (typically wind turbines) decreases when citizens are given the opportunity to invest in and co-own the production installations.
- This is especially true when local citizens are involved from the very start of the project. Stakeholder involvement and direct citizen participation foster social acceptance for renewable energy.
- Local citizens not only share in the profits, they also have access to clean energy at a fair price.

REScoop advantages

Benefits the local community

- REScoops have a clear concern for the community. They usually share part of the profits with their members and use the rest to develop new projects or benefit the local community as a whole. Some REScoops f.i. have financed the construction of a local sustainable concert hall, while others erected a charging point for electric bicycles. Thus, all citizens benefit from the projects and the profits that they generate.

Takes action on energy efficiency

- The revenues that result from renewable energy projects are often used to finance energy efficiency measures in public buildings. Some REScoops have paid for insulation material for public buildings, while others pay the wage of a local energy expert who helps citizens and the local municipality improve their overall energy efficiency.

REScoop advantages

Keeps money in the local economy

- REScoops use local energy sources and include local citizens. Thus they keep money within the local community that would otherwise be lost. In addition, REScoops stimulate local employment and boost the local economy.

Keeps the individual investment affordable

- Not everyone has a roof suitable for solar panels, nor does everyone have the financial capacity to make such an investment.
- REScoop production installations are typically owned by a large group of citizens, keeping the individual investment affordable.

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