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Investing in your future  
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# LECo

## Local Energy Communities



**Development of Practical  
Guidelines to Develop a LECo**



**LECo**

Local Energy Communities

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## DEVELOPMENT OF PRACTICAL GUIDELINES TO DEVELOP A LECO

*T3.2.1 A practical roadmap for the development of community owned 'Energy Villages' will be developed taking into account the outcomes from WPT1 and WPT2 on the different ownership and funding models available, and the best practice learnings from other countries within the NPA region and European Union.*

The LECO project aims to bring together the skills, knowledge and expertise of partners to develop self-sufficient Energy Communities using local renewable resources. The methodology for setting up such local adapted concepts and their implementation is available in the form of practical guidelines the LECO on-line training platform [www.localenergucommunities.net](http://www.localenergucommunities.net). This roadmap for the development of community owned 'Energy Villages' contains further practical guidelines taking into account outcomes from WPT1 and WPT2.

### A. OWNERSHIP MODELS FOR LOCAL ENERGY COMMUNITIES

The following models are the most common forms of community energy in practice.

- The co-operative model: membership based and democratic
- The joint venture: co-ownership between cooperatives, municipalities and energy companies
- The local company: initiated by a local entrepreneur with support from the community
- The municipal utility: a municipality owns and operates an energy utility.

#### 1. The Co-Operative Model

A Co-Operative is defined by the International Co-Operative Allianz as "*an autonomous association of persons invited voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise.*"<sup>1</sup> An energy co-operative is democratic and empowers members of a community to invest in energy projects that have a tangible benefit to the community and create sustainable forms of renewable energy.

Finland has the most number of co-operatives in the world, having 5,000 in 2015, which employed 17% of the population. In 1899 the confederation of Finnish co-operatives was founded and there were 103 renewable energy co-operatives enterprises in 2015. Most energy cooperatives formed between 1990-2010 due to outdated heating systems and rising oil prices.

In Germany, by the end of 2017, there were 855 energy co-operatives involving 183,000 citizens as members. They owned €682m in capital bought by members with a majority of co-operatives active with PV electricity production due to profitable feed-in-tariffs until 2014. Changes in the Renewable Energies Act lead to dramatic decreases in the founding of Energy Cooperatives.

There is a long history of agricultural co-operatives in Ireland since 1900. The Irish Co-Operative Organisation Society (ICOS) is the force behind the movement. ICOS member co-operatives and their associated companies have a combined turnover of almost €15 billion in seven core categories – multipurpose dairy co-ops; livestock sector co-ops; store, trade and wholesale co-ops; service-related co-ops; community-oriented, culture and leisure co-ops, food, fishing and beverage co-ops; and advisory and education-related co-ops. Energy cooperatives in Ireland are in their infancy, and there are currently 4 in operation.

Cooperatives have a long tradition in Sweden, and the 100 largest cooperatives enterprises have sales of SEK 400 billion per year and 100,000 employees, making cooperation a key part of Swedish business life.<sup>2</sup> There are several different types of cooperatives or co-owned energy production. For example: community cooperatives with private members; housing cooperatives and municipality ownership. Co-owned small scale hydropower exists and small scale local district heating is owned by farmers, individuals or are co-owned by local stakeholders.<sup>3</sup> Most co-owned energy production in Sweden is in the form of economic association.

#### 2. Joint Venture

A joint venture is when co-ownership occurs between co-operatives, municipals and energy companies also known as a public-private partnership (PPP). These models can present unique opportunities for regional cooperation not only in renewables but also in grid ownership.<sup>4</sup> Finland have many examples of co-ownership between municipalities and energy companies. However, these are in large part achieved with a jointly owned limited company. Germany has also established co-ownership models between citizens and municipal or private companies in the renewable energy sector depending on scale and type. Ireland have yet to establish any formal regulations relating to joint ventures. It is expected that the new Renewable Electricity Support Scheme (RESS) may provide a platform for this model as developers will need a minimum of 20% community owned investment.<sup>5</sup> Most district heating companies in Sweden are municipally owned with a professional energy company as shareholder in many instances.

1) <http://ica.coop/en/what-co-operative>

2) Svensk Kooperation: URL: <https://svenskkoperation.se>

3) Sveriges Vindkraftkooperativ: URL:<http://svef.nu/>, Natverket for Vindbruk: URL:<https://www.natverketforvindbruk.se/>; Svensk Vindkraft Forening: URL: <http://www.svensk-vindkraft.org>

4) Roberts, J., Bodman, F., & Rybski, R., (2014). Community Power: model Legal Frameworks for Citizens Owned Renewable Energy. ClientEarth, London.

5) <https://www.dccae.gov.ie/en-ie/energy/topics/Renewable-Energy/electricity/renewable-electricity-supports/ress/Pages/default.aspx>

### 3. Local Company/CLG

This model is usually initiated by a local entrepreneur and supported by the community. In Germany outside of electricity self-consumption and grid injection by local entrepreneurs community energy projects involving local private companies are largely built around district heating. This model is also evident in Ireland in the smaller RE installations. For example, a local farmer gets permission to connect turbines on his land with no objections from the community. This model is not in use in Finland.

### 4. Municipal Utility Company

In this instance a municipality owns and operates an energy utility. Prior to privatisation municipals were at the centre of providing public service such as heat electricity and water.<sup>6</sup> They should be able to play a leading role in generating local community power again, however it needs to be recognised that profits may be placed ahead of public interest. In Finland there are currently 400 energy utilities listed in the Finnish Energy Authority's Power Plant Register. Municipalities and cities are in many cases the owners of these energy companies. However, the share of fully owned municipality energy companies has decreased in recent years. Municipalities are very common in Germany. The German Association of Local Utilities (VKU) has 733 members active in electricity supply providing approximately 12% of the electricity in Germany and own almost 45% of the power distribution grid. This model is also very common in Sweden. In 2017, Sweden had 449 municipally owned companies in the area of energy production and distribution. The organisational and business models are usually shareholder companies and trusts

More information on ownership models for Community Energy Projects available at <https://localenergycommunities.net/ownership-opportunities-for-local-energy-communities/>

## B. FUNDING MODELS

### 1. Grant Aid

Finland provides grant aid for projects that promote renewable energy production or energy efficiency or further low carbon energy production. In Ireland, communities can avail of grant aid through Sustainable Energy Authority of Ireland (SEAI) programmes. Communities can also avail of the upcoming Renewable Electricity Support Scheme (RESS) where there is a provision for financial supports for community led projects including feasibility studies.

Sweden provides investment supports for Solar PV, Energy storage and Wind energy. The premiums for wind is based on how much new wind power was put into operation. The Kilmatklivet (climate fund) supports measures that reduce carbon emissions at local level.

Grant aids are widespread funding instrument, predominantly for renewable heat and efficiency related investments.

### 2. Loans

Communities can avail of low interest community loans. MuniFin, a credit institution in Finland, offers specific loans for environmentally friendly projects. Low interest loans, often combined with repayment grants are a common instrument in public funding programmes for renewable energy and energy efficiency in Germany too. In Ireland, some credit unions offer 'Green Loans' for environmentally friendly projects. The Western Development Commission (WDC), Clann Credo and Community Finance Ireland offer low interest community loans. Swedish municipalities and regions can avail of sustainable finance through the organisation Kommuninvest.<sup>7</sup>

### 3. An Energy Service Company (ESCO) Models

An energy savings performance contract (ESPC) is a model where an Energy Services Company (ESCO) achieves energy savings at a property or portfolio of properties as a service. This model guarantees savings for a set period of time in exchange for payment from the energy cost savings. An ESCO will assess the efficiency opportunity, purchase equipment necessary to improve performance, and install the equipment. Most ESCOs will provide a financing option for these services as well, but depending on the ESCO, the building owner may be required to seek outside financing.

Finland have some large scale energy-saving projects that have been implemented via an ESCO model. For example, the city of Aka in Pirkanmaa has improved the energy efficiency through the ESCO model. Contracting is a well-established model in Germany for both energy supply and energy performance. More innovative contracting models are applied in regard of battery storage system and solar self-consumption, landlord-to-tenant electricity and demand side management. This is relatively new model for Ireland with few working examples. ESB networks and Kingspan recently came together to offer a funded solar model to organisations. There are currently 5-6 companies offering EPC services in Sweden, some of which are international companies also providing EPC in other countries. The three main providers are Siemens, Caverion and Schneider Electric and between them they cover most of the Swedish market. Most of the ESCOs are primarily active in the public and governmental sector.

6) Roberts, J., Bodman, F., & Rybski, R., (2014). Community Power: model Legal Frameworks for Citizens Owned Renewable Energy. ClientEarth, London.

7) <http://kommuninvest.se>

## 4. REFITs

Renewable energy feed-in tariffs (REFITs) is when premium prices for renewable electricity generation are generally paid by customers; sometimes (as in the Danish case) also supported by state subsidies. Other countries such as the UK, Ireland and France have bidding systems for renewable energy supply contracts which guaranteed subsidised tariffs for a specified volume and duration. In Finland, there is a feed-in-tariff for the production of electricity based on wind power, wood-chips, other wood based fuels and biogas. However, there are no specific feed-in-tariffs for small scale electricity providers. Germany's REFIT scheme gives fixed and guaranteed FITs over 20 years along with feed-in priority over conventional electricity which provide a secure and simple investment model for private individuals, energy cooperatives, farmers, public local utilities, local businesses and other decentralised. The new Renewable Electricity Support Scheme (RESS) scheme in Ireland, which aims at conducting the first auctions in late 2019 aims to provide a separate auction for community groups as well as providing financial support for communities including feasibility studies. There is also a provision for mandatory investment opportunities for communities and citizens in all RESS projects. However, micro-generation projects were not included or supported in RESS scheme. In Sweden, the main instrument for renewable energy is a certificate system. For each megawatt hour (MWh) renewable electricity producer can obtain a certificate from the state. Electricity producers can then sell the electricity certificates in an open market.

## 5. Tax Incentives

In Germany tax incentives play a relatively small role in the German financial support regime for clean energy. Electric mobility vehicles benefit from a number of tax incentives. There is tax relief available in Ireland in the form of accelerated capital allowance that promotes investment in energy efficient products & equipment. There are also tax incentives for vehicles under the category of electric and alternative fuel vehicles. Sweden applies specific tax rules for microproducers of renewable energy which do not need to pay energy tax or VAT. Sweden also offers two types of tax deductions for work (ROT-deduction) and services (RUT-deduction) carried out in privately owned homes.

## 6. Green Bonds

Green bonds were created to fund projects that have a positive environmental and/or climate benefits. Proceeds from these bonds are earmarked for green projects but are backed by the issuer's entire balance sheet. The Nordic Investment Bank (NIB), a supranational, and Norwegian state bank KBN Kommunalcredit were among the very first issuing green bonds, both debuting 2010. Nordic stock exchanges have also contributed to the green bond market's development. Big banking houses like Deutsche Bank or Commerzbank as well as established banks in the renewable energy and co-operative sector are known issuers of green bonds in Germany. The German Stock Exchange also introduced its own segment for green bonds in November 2018 listing 150 bonds. In Ireland,

in October 2018, The National Treasury Management Agency has today raised €3 billion from the sale of its 12 year "green bond".

More information on funding models and financial options is available at: <https://localenergycommunities.net/finance-options-for-local-energy-communities/>

## C. BEST PRACTICE LEARNING FROM OTHER COUNTRIES

### Exemplary community projects – Case studies

#### Finland

A local resident initiated a wind farm project in 2001 in Larsmo near Kokkola. A 1 MW wind turbine was erected by a company called **Larsmo Vindkraft Oy**. The company consists of 200 local private individuals as shareholders.

Lessons learned include:

- Regular information events for local residents are important to reduce resistance.
- Raise a larger share of own equity, 30-40%.
- Do not assume that the price of electricity will rise.
- Ensure own consumption share of generated electricity is high.
- Engage a consulting company, who acts as a technical advisor.

The **Lohtaja Heat Cooperative** (Fi=Lohtajan energiao-suuskunta) consists of 40 agriculture and forestry members which built, own and operate a wood-chip fired heat plant, which replaced oil heating. The lessons learned were largely positive, only that the wood-chip storage room and the boiler room could have been bigger, which was mentioned in the interviews.

#### Ireland

The **Erris, Co Mayo, community** availed of the Sustainable Energy Authority Ireland's (SEAI's) Better Energy Community (BEC) program to become a Sustainable Energy Community (SEC) in 2015 and started with both energy efficiency upgrades and renewable energy installations.

Lessons learned:

- A clear community ownership model built on a community charter and a master plan was essential.
- Citizen engagement throughout the entire process, was achieved by a three year partnership agreement.
- Financial and technical mentors were available throughout the process.
- Skills development was important.

The Aran Islands Energy Cooperative or Comharchumann Oileáin Árann Teoranta (CFOAT) is a community based Energy Co-Operative representing the three Aran Islands. It grew out

of a community development cooperative. Every resident from the Aran Islands has an opportunity to become involved as a shareholder. CFOAT currently has about 100 shareholders. CFOAT aims to drive the transition on the Aran Islands to carbon neutrality. Part of this challenge is to insulate all the buildings to a high standard, replace oil and coal with heat pumps, solar PV and battery storage, promote electric vehicles, and tap the sources of green energy on the islands to produce enough power to make the islands self-sufficient.

Lessons learned:

- Cooperative rules were adapted to suit the island's particular situation and goals.
- It is important to set clear goals and aims, which provided cohesiveness and inspiration
- Information and education of members and citizens is crucial.
- Communication to members and citizens is essential.
- All would work better if public sector bodies and local authorities could get more supportive

## Sweden

The **Jokkmokk Eco-municipality**, Norrbotten County, owns and operates a small district heating system, which is fired by wood chips. The district heating system supplies 522 buildings in total including public buildings and private households. Insulation and new meters on the consumer side and efficiencies in flue gas condensation on the supply side have contributed to reduced losses and improved efficiency.

Lessons learned:

- Energy efficiency projects are successful and have a short payback time.
- Recruiting competent staff is a challenge for a small and remote community.
- Better metering has detected losses and a new control system has been introduced.
- An efficiency strategy with a long-term perspective has been developed.

**Vilhelmina municipality**, Norrbotten county, constructed a heat pump in its waste water treatment system to recover heat from the sewage and which reduces heating costs for the building.

Lessons learned:

- Energy efficiency projects are considered attractive for the municipalities because of their short payback period and environmental benefits.
- It is important to consider operational and life-time costs at the planning stage

## Germany

The "**Outdoor pool society of Dingden**" was formed as the result of a citizen's initiative. The society installed a rooftop Solar PV system at the public outdoor pool facility in Dingden, Hamminkeln, Germany. The electricity generated is sold to the grid and revenues contribute to maintenance of the outdoor pool.

Lessons learned:

- A small membership fee of only 6 EURO per year was essential for citizens to become members. The society had 3100 members by 2019.
- Citizens/members get a sense of contributing to maintain the outdoor pool, which is an important facility to the community.

A **local energy cooperative in Kappel**, consisting of 470-inhabitants in the state of Rhineland-Palatinate, Germany, operates a district heating network based on local bioenergy. Three local farmers own and operate the biogas plant and they sell the biogas to the cooperative. The cooperative owns and operates all facilities in the heating centre (boilers, buffer tank, wood chip storage, pumps etc) and the heating grid itself. The heat transfer stations and all heating facilities on the customer side are in ownership of each customer.

Lessons learned:

- The Kappel energy cooperative demonstrates, how local citizens, businesses and the municipality can cooperate to establish an efficient and sustainable heat supply infrastructure with stable and affordable prices.
- Strong support from municipal policy was essential in promoting this project. These policies aim to save energy, promote renewable energy and bolster the local economy and quality of life in rural areas.

More information on exemplar projects is available at <https://localenergycommunities.net/case-studies/>



# LECo

Local Energy Communities

## Project Partners

Centria University of Applied Sciences (Finland),  
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The Gaeltacht Authority (Ireland), Lohtaja Energy Cooperative (Finland),  
UiT – the Arctic University of Norway (Norway)

\*Outside the NPA Programme area

