



# PATHWAYS project

Exploring transition pathways to sustainable, low carbon societies

Grant Agreement number 603942

## Deliverable D3.3

Analysis of case studies according to the different approaches  
of analysis

## Case study report on Sustainable Cooperative COOPÉRNICO

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July 2016

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## 1. Overview

*«Co-operatives are highly sustainable businesses, combining financial health, environmental concern and social purpose in a triple bottom line.»* Blueprint for a Co-operative Decade, ICA storybook [8]

In Portugal, there are about 2,400 cooperatives of several types: farming, pharmaceutical, housing, culture, energy, etc. The Portuguese Confederation Cooperative aims to [16]:

- Publicize the operational reality of the cooperatives (influence on society, challenges, strategy) and its role for economic and social development;
- Promote the creation of cooperatives to meet with the economic needs of its members, creating jobs, stimulating innovation and contributing to social inclusion;
- Encourage governments and regulatory bodies to promote policies and laws that generate the formation and growth of the cooperative sector.

Renewable energy cooperatives are autonomous associations of people with the purpose to meet economic, social and cultural common objectives. Their mission is to involve citizens in creating a more sustainable future regarding environment, energy and society, promoted by a direct citizen commitment in projects and insisting on the powerful model of economic democracy. Renewable energy cooperatives have existed for many years in Europe. More than 80% of the installed wind power capacity in Denmark is owned by cooperatives or associations of citizens. Portugal has the exact opposite scenario: around 100% of the electricity generated by the wind is held by large companies or investment funds. Clearly, there is a significant growth potential in the number of renewable energy cooperatives and in the number of citizens involved in the process. Almost two-thirds of all electricity consumed in Portugal in 2014 was produced from hydropower, wind and solar energy. The main challenge for increasing this share is the definition of the payment scheme.

Nowadays, we are facing an energy transition in Portugal: from fossil fuels to renewable energy; from centralised to decentralised production of energy; from wasting energy to efficient energy use. Since this energy transition is paid by taxes applied to the citizen's power bills, it seems rational that the citizens get a stronger control over the energy's production, transport, distribution and supply. Renewable energy cooperatives are the ideal organizational entities to achieve all of these challenges and implement Energy Democracy [6]. To reduce the influence of large companies and their investment funds, citizens must have an important role in the funding of the energy transition at local level. However, in many EU countries like Portugal, the current legislation does not provide sufficient support for community ownership models. This fact, has led to a growing disappointment by the lack of transparency of the conventional financial circuits, leading to an increasing interest in being part of "short-circuits" between investors, even if the risk is higher.

The research made about grassroots innovations such as energy cooperative shows the difficulties in surviving alone or growing in times of crisis: *"(...) they are situated in local contexts while facing pressure to scale up and become mobile/transferrable; (...) initiatives fail to thrive because of an absence of long-term resourcing and institutional support. In addition, the radical values which often catalyse and inspire niche formation can clash with commercial and policy priorities, making the translation of innovative practices challenging, even with dedicated intermediaries. The importance of robust analysis of these initiatives is clear, then, both to assist practitioners in growing their projects, and to enable policymakers to harness the innovative energies of community groups working for*

*sustainability.[28] "Strategic niche management theory is potentially helpful here as it highlights the important roles played by 'intermediary actors' in consolidating, growing and diffusing novel innovations"*

In this context, Coopérnico is the first Portuguese cooperative in the renewable energy sector with a sustainable energy model, fair and responsible contributing to a socially and environmentally sustainable future.



Figure 1 – COOPÉRNICO logo – Green Energy, Sustainability and Citizenship [1]

## 2. Data analysis and methods applied

This section presents the methods applied in the research of the case study, conducted in WP 3.3 of the Pathways project. The objectives of this WP3 report are analysing the factors that contribute to sustainable, low-carbon and resource efficient society through initiatives on the ground, similar to "transitions in the making." It focuses on patterns of interaction of stakeholders, as well as their social behaviours and policies in order to understand how transitions are manifested and where they can be applied [17].

The main focus of the research was the collection and analysis of the various parameters of amplification and forward network of Coopérnico. This research was complemented with the collection of data through interviews with entities involved in the project from the cooperative's founders, members and partners. There was also a research about renewable energy cooperatives and associated initiatives in official websites, newspapers, articles, scientific journals, and policy documents. The different views on the cooperative and its positive and negative impacts were also analysed. The research was divided into three main topics: creation of the cooperative, how to be a member, projects already implemented and network of the initiative (opinions and connections).

The questionnaires made to the several stakeholders involved were based on the WP 3.3 case study protocol [18] and focused on three stages (creation, development and implementation period) through the next essential topics:

- 1 - Relevant factors that motivate the creation of sustainable cooperatives in Portugal;
- 2 - The creation of Coopérnico;
- 3 – How renewable energy projects of Coopérnico contribute to reduce carbon emissions;
- 4 - The barriers/drivers that arise in the development of the cooperative;
- 5 - The benefits and support that Coopérnico provides in its implementation;
- 6 – Sustainable cooperatives impacts.

The following stakeholders were involved in the research:

- Nuno Brito Jorge – Coopérnico (founder and current president)
- Daan Creupelandt – RESCooP (European partner)
- Inês Besugo – Biovilla (partner/member)
- João Dias – APPACDM (partner)
- Pedro Marques - Porto de Raiz (partner)

### 3. Detailed case description

This case description focuses on the genesis of Coopérnico at three stages: Creation, Development and Implementation period. The description of the three stages is presented in this chapter.

#### 3.1. Cooperative creation

The history of Coopérnico began when three friends got together to invest their savings in a photovoltaic project in the Algarve. The main reasons were that it was easy to install, the law for photovoltaic production technology was amended, and the sun is one of the most abundant sustainable resources to invest in. However, it was necessary to call for help so that the project could move forward. In early 2013, more people joined the group and invested in a solar photovoltaic system at Quinta do Caracol, in Tavira, with an installed capacity of 16.5 kW.

More people started to join this group, and in October of 2013 they got a photovoltaic project in a solidarity institution in Lisbon (Portuguese Association of Parents and Friends of People with Disabilities), with an installed capacity of 23.5 kW. They decided to move on to a sustainable business model, creating the Coopérnico cooperative in November of 2013. Coopérnico was founded by a group of 16 citizens with ages between 30 and 40 years old, from different professional areas with different backgrounds. It includes engineers, lawyers, professors, economists, administrators, a marketing manager and even a policy officer. They all share a common concern: sustainable development.

The founders were: Nuno Brito Jorge, Sara Ramos, Bernard Orr, João Pedro Gonçalves, Filipe Moreira Alves, Mathieu Richard, Pedro Sousa Lobo, Miguel Aroso, Leonor Orr, Duarte Marques, Carmen Estevez, José Brito Jorge, Ana Rita Antunes, Ricardo Iglésias, Susana Fonseca and Henrique Burnay (Figure 2).



Figure 2 – Coopérnico founders [1]

Nuno Brito Jorge: “Coopérnico has the mission to involve citizens and companies in the creation of a new energy paradigm (renewable and decentralized) in society and environment’s benefit. The project wants to provide an opportunity for Portuguese people to consume green electricity through the participation in the capital of the association. With the financial crisis in Portugal it is imperative to find alternative solutions to the big companies and invest in real projects. Coopérnico is an innovative solution, it allows to the Portuguese people to be owners of their electricity company as well as manage it.”

In November 2013, Coopérnico’s founders started a sustainable business model with environmental, economic, social and political goals. The Portuguese cooperative had European cooperatives as

example of success for their business model: Ecopower (Belgium [10]); Enercoop (France [11]); De Windvogel (Netherlands [12]) and SomEnergia (Spain [13]).

The focus of the renewable energy cooperative is on [1]:

1. Creating a large community of citizens and businesses willing to contribute to a new energy, social and business model;
2. Improving part of the savings in investment in small renewable energy projects where each one can be owner of the part that you want;
3. Integrating the electricity produced into the national power grid and serving to supply families and business;
4. Generating economic benefits from the sale of electricity produced and environmental benefits with the clean electricity production (without CO<sub>2</sub> emissions and other pollutants);
5. Distributing the benefits generated between the company, investors and the environment;
6. Establishing partnerships with other cooperatives.

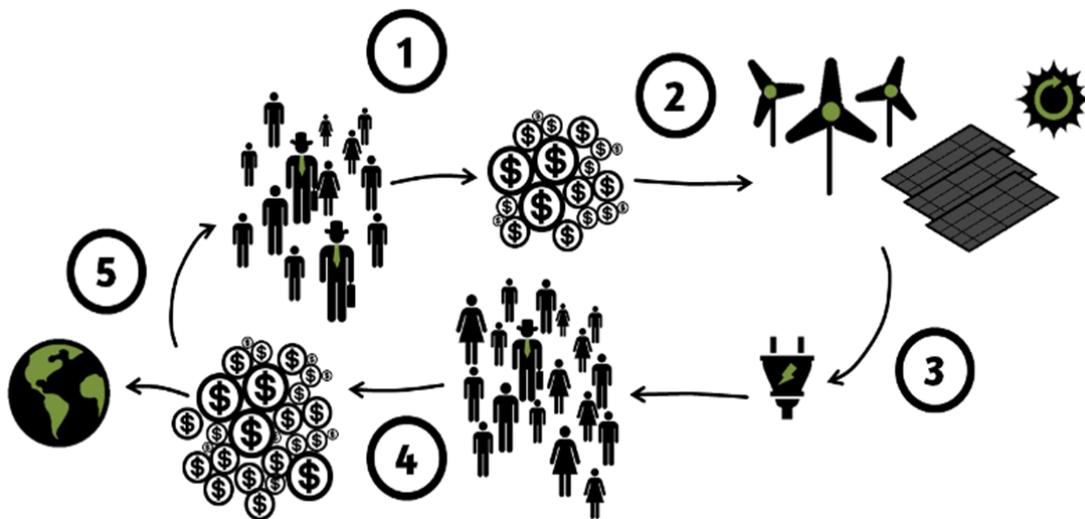


Figure 3 - The stages of renewable energy cooperative [1]

### Analysis of identified barriers

Nuno Brito Jorge: "Creating a cooperative is not an easy process, because it involves a more complex bureaucracy than to start a business. You need at least five people that have their own statutes defined and a registered capital of 5000€. Apart from that, there is no online platform to simplify the process. The founding members decided to create a cooperative model and not a company, in order to promote the social impact and empowerment of citizens in an economic activity, in addition to promoting investment in sustainable projects and allowing a clear division of profits between the members."

This rearing to Coopérnico was troubled due to lack of capital. Neither the banks or companies lend money to a new cooperative project with no guarantees of success, so there was no capital to start new projects. This lack of confidence in an ecological cooperative comes from the wrong idea of comparing cooperatives with communist groups, not relying on new projects.

There were several barriers in the cooperative creation phase:

- Inadequate legislative context: legal issues and the complex bureaucracy;
- Inertia: resistance to new ways of energy sustainability;
- Funding problems from the banks;
- Lack of investment in renewables and investment in energy efficiency, since consumption is unsustainable;
- Bad reputation of cooperatives in Portugal: some cooperatives with state-sponsored and proliferation of ideologically corrupt cooperative models;
- The mistrust of the people and companies.

Some of the solutions which allow the proliferation of Coopérnico were:

- Ask financial aid from European cooperatives;
- Promote cooperative actions in the media ( television, newspapers, social networks);
- Public presentations ( workshop , conference, lecture );
- To sensitize society to environmentally sustainable decisions;
- To motivate investors to socially beneficial projects.

Faced with the several challenges, the Portuguese cooperative had the need to resort to RESCooP.EU (Renewable Energy Sources COOPerative) for financial and management support. Only then was possible to create a European consortium to invest in the former projects with the capital of three European Cooperatives: SomEnergia from Spain [13]; Beauvent from Belgium [14]; Coöperatie Windenergie Waterland from Netherlands [15].

### 3.2. Development period

In the development phase, Coopérnico was focused on defining its objectives and commitments once has members who invest profitable savings and allow the projects become reality. Therefore, the cooperative has four commitments to its members [1]:

- **100% Green Energy** - all produced electricity comes only from renewable sources;
- **Creating social value** - all the projects create a social value through the direct collaboration of organizations of social or educational economy;
- **Local development** - the creation of a new project priority is given to local partners in order to create green employment at local level and promote the transition to a more sustainable economy;
- **Transparency and integrity** - are the basis of long and trusted relationships. Share updated information on projects with all the members who supported them.

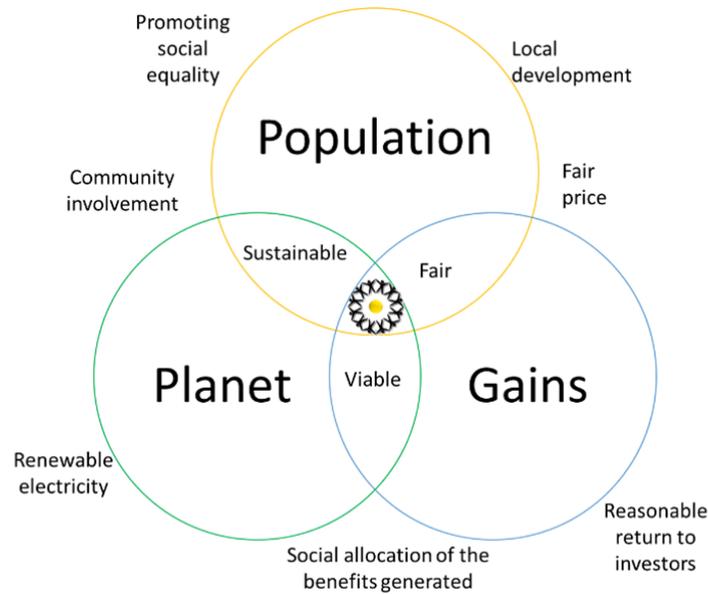


Figure 4 – Sustainable business model of renewable energy cooperative

### Identified barriers

There were some barriers to overcome in the cooperative development phase:

- Established partnerships with other cooperatives with the same principles;
- Find partners to develop and fund the projects;
- The mistrust of the people and companies;
- Motivate citizens to become members of the cooperative and participate in projects.

### Stakeholders involved

In a cooperative is essential to have good relations with the various stakeholders involved, each actor plays an important role in its management and operation. What differentiates a cooperative of a company is its democratic management and established partnerships with other cooperatives, such as Biovilla (the Portuguese cooperative for Sustainable Development with a Permaculture design [9]). The relationship with other cooperatives with the same goals boosts Coopérnico and overcoming the challenges.

In the development phase of Coopérnico, RESCooP was the drive to boost the projects. RESCooP is short for Renewable Energy Sources COOPERative, it is the European federation of groups and cooperatives of citizens for renewable energy [6]. Nuno Brito Jorge: “Coopérnico is one of their founders’ members. REScoop was created by a group of citizens that cooperate in the field of renewable energy and energy efficiency, developing production, selling renewable energy, providing services to new initiatives. Not only cooperatives should participate in knowledge sharing network, but all community energy initiatives, by way of social and technical learning.”

It was only by networks RESCooP that Coopérnico got funding to implement the first projects through a European consortium with the financial support of other three European Cooperatives, as mentioned in the previous chapter. It was possible to get in contact with them and learn about the good relationship between Coopérnico and REScoop.eu, by Daan Creupelandt: *"We can ensure you that their daily operations as well as their RES projects comply to the cooperative principles that have been identified by the International Cooperative Alliance (ICA). All we can say is that Coopérnico puts great effort to make energy transition a success throughout Europe. We are proud to count them amongst our members."* Daan Creupelandt is the financial coordinator of the RESCooP 20-20-20 project and works at Ecopower where he improves the financial and cooperative processes.

Related to the work that need to be done in Portugal, there is an interesting partner in terms of social learning: the ALA project. It is a network which brings together companies, citizens and IPSS (Private Institutions of Social Solidarity) in order to create favourable conditions for the acquisition of products and services appropriate to the needs of each one [21]. This partnership between Coopérnico and the ALA project aims to help most of the institutions of solidarity and their daily activity, through power management solutions in the integration of solar projects and supply of green energy cooperatives. Marco Mosque, Founder of ALA project: "Being part of a project that unites the best in the area of renewable energies around a common good is part of the DNA of the ALA, being a challenge that we share with great pleasure."

Nuno Brito Jorge: "The principal stakeholder of cooperative is the citizen that becomes a member." Membership consists in being one of the Coopérnico owners, with a democratic management and free participation. Members are engaged in a social movement and citizen initiative, which promotes an ecological development and the creation of a sustainable energy use; they have a direct participation in renewable projects maximizing savings while protecting the environment and supporting projects of social solidarity [1].

There are many ways to participate in the cooperative, including:

1. Become a member of the cooperative, to join just fill the form and buy 3 titles of capital;
2. Be an investing member participating in the projects: investment in renewable energy projects of Coopérnico has interesting long-term returns that combine economic benefits with environmental and social;
3. Participate in a workgroup: the Coopérnico demand evolves through the contribution of its members;
4. Being a volunteer, if you have knowledge and / or experience who believes that may be useful for the activities;
5. Be potential partner / local supplier - Coopérnico always tries to use local suppliers.

To join Coopérnico you need to purchase three titles of capital of the amount of 60€. These titles do not have a fixed remuneration, you get paid with the distribution of the excess revenue. You can only engage in the activities and participate in the cooperative projects after the membership and payment of the respective titles of capital [1]. Members rights include [1]:

1. Using the services and benefits from the advantages of the Cooperative;

2. Take part in the General Assembly, submitting proposals, discussing and voting the points in the agenda;
3. Elect and be elected to the bodies of the Cooperative;
4. Participate in the decision of the projects to be supported;
5. Investing in the Cooperative projects;
6. Participate in thematic working groups;
7. Participate in workshops, conferences and other events organized by Coopérnico;

There are different types of Coopérnico members [1]:

- **Founders:** members who created the Cooperative;
- **Effective members:** any person communing of the Cooperative goals and admitted by the Director;
- **Benefactors:** those who make valuable contributions to property or securities for the purposes of the Cooperative and are proclaimed by the General Assembly (with a minimum value of 500€); [Investments in Coopérnico designs are supportive. The remuneration is made regardless of the results of the chosen project, with the results of the performance of all our projects. The calculation of interest is made from the day following the availability of capital in Coopérnico bank account. If the project is cancelled, the full amount is returned;
- **Honorary members:** those which contribute significantly to the prestige or objectives of the Cooperative and are proclaimed by the General Assembly with voting at least 2/3 of effective cooperative gifts.

## Organisation of Coopérnico

Nuno Brito Jorge: “The creation and management of cooperative has been on charge of the founding members. Despite being a democratic cooperative, is needed an active and transparent leadership that makes the cooperative moving forward. Everyone is invited to join the group and collaborate in the cooperative’s management.”

The Coopérnico is organized as a common association: General Assembly, Board of Directors and Audit Committee. The cooperative organization includes the names of the current union leadership:

### **General Assembly:**

Chairman: Pedro Sousa Lobo

Vice President: Miguel Aroso

### **Board of Directors:**

President: Nuno Brito Jorge

1st Member: Susana Fonseca

2nd Member: Bernard Orr

### **Audit Committee:**

President: João Pedro Gonçalves

1st Member: Mathieu Richard

2nd Member: Filipe Moreira Alves

## Work groups

In order to organize and expedite the discussion on more specific topics of interest to the Coopérnico, it was decided by the General Assembly to proceed with the creation of the Working Groups. Each member can participate in different working groups [1]:

### **1. Innovation**

A working group with the purpose of following up developments in the energy sector, identify new areas of activity for Coopérnico and evaluate the respective interest. Follow new trends in the areas of renewable generation and energy efficiency and also find interesting projects for Coopérnico be involved.

### **2. Governance**

Created with the aim of developing a practical and simple manual, which summarizes the rules of the organization, ensuring a common vision about the standards and management style, the different aspects of the Coopérnico activity. Aspects such as recruitment and proposal requests, remuneration of the members who carry out work, rules for the general meeting and others shall be incorporated.

### **3. Communication**

Cooperative image management and organization of events. Divulcation of Coopérnico, such as general meetings, newsletters, communications to members, campaigns and other events.

## **3.3. Implementation period**

The implementation period starts when the initiative makes steps into the realisation of the plans. In the case of Coopérnico this period corresponds to the implementation of renewable energy projects and increasing number of members. Nuno Brito Jorge: "The implementation of each project began when the return on investment showed that the money spent is proportional to the energy produced."

The following table shows the timeline of the projects implemented by Coopérnico. The first two projects (in orange, Quinta Caracol and APPACDM) have been implemented with the savings of the founders' members and allowed the creation of the cooperative. It emphasizes the fact that the cooperative officially began in November of 2013, with the financial support of European Consortium (in blue). In 2015, Coopérnico wants to use profits, member's capital and energy contracts (in green) to get independence of European consortium and invest in new future projects.

Table 1 - Timeline of implemented projects

Project	Period		Development period	Implementation period of cooperative				
	Gestation period			Feb 2014	May 2014	July 2014	Nov 2014	June 2015
Quinta Caracol (in Tavira, Algarve)	[founders' capital]		European consortium:  financial support for next projects from three European Cooperatives	European consortium capital				
APPACDM - Lebre e a Tartaruga (in Lisbon)								
APPACDM - CAO Júlia Moreira (in Lisbon)								
Associação João Santos (in Lisbon)								
Biovilla Cooperative (in Arrábida)								
Mangualde (in Viseu)								
Coopérnico: first cooperative selling green energy in Portugal							[profits and energy contracts]	

The mission of renewable energy cooperatives is promoting direct citizen commitment in projects, thus, one important step is to “create an environment where the innovation and ideas of communities can flourish” [28]. One of the greatest difficulties in the implementation of new projects involves convince institutions managers of the advantages of being involved in renewable energy projects because they are not aware of the environmental problems.

## Projects

Currently, Coopérnico strengthens its financial participation in the European consortium, with the investment of its members and joining part of the savings generated by the implemented projects in order to get independence from the consortium. The next step, when the investment of European Consortium get paid (might be in 2016), will be possible to invest in new renewable energy projects, in which each Coopérnico member can own the part they desire. The minimum investment and the investment conditions will vary from project to project. The aim is that projects have a return for investors of between 4% and 6 % per annum, with a minimum investment of 500€.

Nuno Brito Jorge: “Currently, Coopérnico is in the world top of renewable energy crowdfunding platforms [31], members have the possibility of being owners and green energy producers, by applying their savings in our solar projects (via internet [1]), with an interesting financial return.”

The main source of energy produced by Coopérnico's is photovoltaic solar energy, due to its versatility and adaptation to different dimensions of projects. However, the cooperative considers to integrate other sources of renewable energy in its portfolio. Below, the projects already implemented are presented.

## QUINTA DO CARACOL

*Quinta do Caracol* was the first project of Coopérnico in April 2013 [23]. The photovoltaic system is surrounded by nature, situated in a rural tourism, 10 minutes' walk from Tavira (Algarve). The result of 10 people involved who wanted to monetize investments in a different and environmentally responsible manner. After the entry into service and a first year of operation in which the central was 12% above expectations, Coopérnico released another phase of participation for its members [1]. The details of the project are provided in Table 2. The biggest challenge of this project is the fact that it is the pilot project for the founding members who wanted to invest and there were no guarantees of success.

Margarida Viegas, Owner, Quinta do Caracol: "Receiving the first project makes us proud. It is a way of contributing to a more sustainable future and save on electricity bill."



Figure 5 – Pilot project, Tavira (2013) [23]

Table 2 - Project Details: Quinta do Caracol (Tavira)

Network power	15.0 kW
Power	16.0 kW
Total Investment	32 500€
Annual Output	23 920 kWh
CO2 Savings	15.3 Ton CO <sub>2</sub> /year
Number of Houses Powered	9

## A LEBRE E A TARTARUGA

The nursery school "A Lebre a Tartaruga" is one of many social activities of the Portuguese Association of Parents and Friends of People with Disabilities (APPACDM) [24]. This project has put photovoltaic panels on the roof of the nursery school. Coopérnico performed the solar system installation in prosecutor's nursery roof with no cost to the association. This project is a contribution to

the production of clean energy from renewable resources, to support a social solidarity institution and to take a responsible profitability on invested capital [1].

Evelyn Koch, Investor nursery school: "The partnership proposal was accepted immediately, because it is very interesting in social terms with effective environmental benefits. In economic terms, it is interesting since it succeeds in lowering the energy cost, without any investment on our part." João Dias, APPACDM: "I am delighted to be part of this project and I am sure it will grow very quickly."



Figure 6 – Solar Photovoltaic panels on the roof of the nursery school (APPACDM) [1]

Table 3 - Project Details: APPACDM Lisboa

Network power	20.0 kW
Power	23.0 kW
Total Investment	29 000€
Annual Output	34 104 kWh
CO2 Savings	21.8 Ton CO <sub>2</sub> /year
Number of Houses Powered	13

### CAO JÚLIA MOREIRA

The Occupational Activity Center Julia Moreira has currently 90 clients with intellectual disabilities. It has a building with great accessibility conditions and a set of infrastructure aimed at enhancing the needs of this population including a gym, a sensory room / relaxation and a therapeutic pool [1, 24].

The intervention of Coopérnico, in April of 2014, consists in the installation of photovoltaic panels that cover part of the roof with an almost perfect south orientation.



Figure 7 – CAO Júlia Moreira project [1]

Table 4 - Project Details: CAO Júlia Moreira

Network power	30.0 kW
Power	27.0 kW
Total Investment	33 000€
Annual Output	39 150 kWh
CO2 Savings	25 Ton CO <sub>2</sub> /year
Number of Houses Powered	15

### ASSOCIAÇÃO JOÃO SANTOS

The Association of João dos Santos is an institution that organizes activities for children. It was founded in 1993 with 35 children and 8 employees. Currently, it has 147 children, creating 23 jobs in 5 different buildings [25]. The new Association's building gathers all these poles in a single building, and will support a greater number of children, including nursery valence.



Figure 8 – PV plant on the roof of the building (Association of João dos Santos)[1]

In May of 2014, Coopérnico promoted and operated a photovoltaic power plant on the roof of this new building for the production of green electricity [1]. In return, the Association receives a fixed percentage of the income generated by the PV plant that will help to ensure the maintenance costs of the new facilities.

Table 5 - Project Details: Associação João Santos

Network power	44.0 kW
Power	40.0 kW
Total Investment	47 000€
Annual Output	65 250 kWh
CO2 Savings	41.8 Ton CO <sub>2</sub> /year
Number of Houses Powered	25

## BIOVILLA

This is the first COOPÉRNICO project that results from the cooperation between cooperatives. The Cooperative Biovilla is a unique entrepreneurial project in Portugal, located in Arrábida [1][9]. Since July of 2014, this project was contributing to energy self-sufficiency of Biovilla, through clean energy production from renewable resources applied to buildings of cooperative and maximizing the capital of Coopérnico and members investment.



Figure 9 – Biovilla – cooperation between cooperatives [1]

This project is based on three pillars: the social pillar directed to the care of people, the environmental pillar related to land use and the economic pillar motivated by fair distribution. Inês Besugo: “Biovilla aims to promote the social, economic and environmental development in an integrated and balanced manner through practical and innovative business models that put the Sustainability in the center of its activities.”

Table 6 - Project Details: Biovilla

Network power	7.1 kW
Power	7.0 kW
Total Investment	9 500€
Annual Output	11 280 kWh
CO2 Savings	7.2 Ton CO <sub>2</sub> /year
Number of Houses Powered	4

### PORTO DE RAIZ

Porto de Raiz, founded in March of 2013, is a social enterprise based in Porto, which operates in the environment and sustainability's area. Works with a sustainable attitude through communication, events and training for individuals and businesses. It encourages the creation of synergies between entities of areas (environmental, social and economic) as an effective strategy for the development and transformation [22]. COOPÉRNICO becomes involved with Porto de Raiz in the event CIDADE+ in July 2014, celebrating Citizenship, Environment and Sustainability in urban context. The event presented a number of initiatives, including Conferences, Workshops, the Lab +, Eco-Market, Arts and Shows, Open Classes, Corporate Square and Network+ [22].

Pedro Marques (Porto de Raiz): "To think in a structured way the social, economic and environmental components is the basis for any project of the field of sustainability, something intrinsic to the concept of Coopérnico, and that will surely be the key to its success."

### MANGUALDE

Situated in Mangualde (Viseu), this photovoltaic project results from a partnership with the City Hall and has an installed capacity of 86 kW and an annual output of 120.400 kWh. The system is divided in two parts: the Municipal Library and the Water Treatment Station. The initial investment of 13 000€ (10% of 130 000€) was available to all members and served to buy the first fraction of this project in November 2014. It was estimated that can prevent the emission of 77.1Ton CO<sub>2</sub>/year and will produce enough electricity to power 46 households [1].



Figure 10 – The Photovoltaic plant in Mangualde [1]

Table 7 - Project Details: Mangualde

Network power	80 kW
Power	86 kW
Total Investment	133 500€
Annual Output	120 400 kWh
CO2 Savings	77 Ton CO <sub>2</sub> /year
Number of Houses Powered	46

## Green energy trading

Since June 22 of 2015, Coopérnico became the first cooperative to commercialize green electricity in Portugal. It was planned from the beginning and involved a political and legal process that took several months. The cooperative is one of the 56 organizations recognized by the General Directorate of Energy (DGE) as being able to sell electricity. This is one of the greatest achievements for Coopérnico, becoming an example of innovation and progress in combating the crisis in Portugal, presenting a sustainable and environmentally friendly solution. In addition, Coopérnico offers the cheapest fee of the energy market according to reference prices of May 2015. New customers do not need to change their counter or interrupt the power supply in the process of changing provider.

### *Liberalisation and policy influence*

The process of liberalisation of the electricity sectors in Europe was carried out in a phased way, and started by including just consumers with higher voltage levels. Portugal followed an identical methodology, the market was progressively opened between 1995 and 2006. Since the 4th of September 2006, all consumers in continental Portugal have been able to select their electricity supplier. This date anticipated the compliance with Directive no. 2003/54/EC, which was established in 1st of July 2007 for all electricity consumers. Associated with the liberalisation and the internal market in electricity is an expected increase in competition, reflected in prices and the improvement in the quality of the service, which should lead to greater satisfaction on the part of electricity consumers. [27]

Portugal's energy policy options in terms of renewable energy production have been largely discussed over the last years, and is still not sufficient to explain its effective costs and benefits. Moreover, the current electricity tariff structure is complex and it has been also target broad debate in the media, often without the rigor and detail recommended [30]. Although, the cooperative doesn't have a role in the parliament, its opinion about feed-in tariffs was heard and weighted by the Energy's General Secretary.

Nuno Brito Jorge: "When the cost of green energy production is below the level of electricity retail prices, self-consumption contributes to market integration of Renewable Energy Sources."

When Coopérnico becomes a supplier in the liberalized energy market, the cooperative takes another step toward the realization of its mission to involve citizens and business in creating a new energy paradigm - renewable and decentralized - to benefit society and the environment.

### *Benefits*

Nuno Brito Jorge: "To access the supply available from Coopérnico you must be a member of the cooperative. There are three advantages to the consumer: First, becomes the owner of the company that provides electricity and you can participate in its decisions; Second, Coopérnico ensures that the total electricity consumed by the members along each year is compensated by production from renewable sources; Third, you have access to more competitive rates."

### **Identified barriers**

There are a few barriers in the implementation of Coopérnico's projects:

- Established partnerships with partners/customers to implement solar projects;
- The lack of knowledge about sustainability from people and companies;
- Motivate citizens to become members of the cooperative and participate in projects;
- Complexity of political and legal process to commercialize green electricity in Portugal.

Some of the solutions to overcome the obstacles are:

- Promote cooperative actions in the media (television, newspapers, social networks);
- Public presentations (workshop, conference, lecture);
- To sensitize society to environmentally sustainable decisions;
- Establishing a traineeship program with University and motivate students;
- Never give up.

## **3.4. Further development**

The Coopérnico is constantly developing new projects and its main concern is to continue to invest in renewable energy projects and raise awareness of environmentally and financially sustainable decisions. The most important factors for the success of this initiative are the behavior of the consumers and their awareness of environmental issues, energy consumption management tools, the relationship with the public and the active contribution in political issues. The Coopérnico proposes energy efficiency measures to make its members more aware of their energy bills and their carbon footprint.

Services that are available for members include:

- Green Energy Trading
- Funding of individual projects
- Protocols and partnerships
- Service packages (Table 8).

Table 8 – Service packages of energy efficiency

Type of service	Description
Basic	<ul style="list-style-type: none"> <li>• Analysis of energy bills</li> <li>• Study the best tariff</li> </ul>
Simple	<ul style="list-style-type: none"> <li>• Basic service</li> <li>• Energy monitoring</li> </ul>
Efficient	<ul style="list-style-type: none"> <li>• Simple service</li> <li>• Consumption monitoring</li> <li>• Consumption profile analysis</li> <li>• Identification of periods of higher consumption</li> <li>• Determination of power required</li> </ul>
Efficient +	<ul style="list-style-type: none"> <li>• Efficient service</li> <li>• Equipment data sheet</li> <li>• Recommendation consumption minimization measures</li> <li>• Equipment Recommendation</li> </ul>
Super-Efficient	<ul style="list-style-type: none"> <li>• Efficient + service</li> <li>• On-site by technical</li> <li>• Energy Certificate</li> </ul>

Some upcoming challenges include:

1. Purchase back of projects participated by the European consortium;
2. Development of more regional centers;
3. Extension of the working groups;
4. Support to local initiatives;
5. Technological Diversification (mini wind turbines, mini hydroelectric, etc);
6. Promotion of the projects' production with new legal framework;
7. The energy independence of the member's encouragement.

## 4. Summary

Coopérnico was founded by a group of 16 citizens from different professional areas: Three friends got together to invest their savings in a photovoltaic project, more people joined to the group later in order to invest in more solar projects and create the cooperative. Coopérnico is focused on creating a renewable energy model, fair and responsible, contributing to a social, environmental and sustainable energy future. It is the first Portuguese cooperative to promote the collective investment of citizens in renewable energy projects and to commercialize green electricity. In addition to the collective investment in projects' production, it also enables citizens to use green energy in their home.

Local production of solar photovoltaic (self-consumption) is an excellent step for consumers to become more aware of how they use energy and is an excellent contribution to energy efficiency, above increasing the production of renewable in Portugal. In this context, the current legislation, although it has gaps and presents some barriers, allows more people to start self-production and may have multiplier effects in a more sustainable use of energy in everyday life.

The most important elements of social configurations for the cooperative are the behaviors of consumers and the difficulty of raising awareness of environmental issues, the management tools of power consumption, the connection with the public entities and active contribution in political issues.

There were several barriers in the cooperative development: inadequate legislative context (legal issues and the complex bureaucracy); inertia (resistance to new ways of energy sustainability); funding problems from the banks; lack of investment in renewables and investment in energy efficiency; bad reputation of cooperatives in Portugal (some state-sponsored cooperatives proliferate on ideologically corrupt cooperative models); the mistrust of the people and companies; established partnerships with other cooperatives with the same principles; finding partners to develop and fund the projects.

Some of the solutions to overcome the barriers are: financial aid from European cooperatives; promote cooperative actions in the media (television, newspapers, social networks); public presentations (workshop, conference, lecture); and sensitize society with environmentally sustainable decisions. Regarding the latter, Coopérnico contacted the University of Lisbon two years ago with the goal of establishing a traineeship program and sensitize students to sustainable issues.

The administration of the cooperative has been in the hands of the founding members. Despite being a democratic cooperative, it needs an active and transparent leadership that makes the cooperative move forward. The group of Governance was created with the aim of developing a manual, practical and simple, which summarizes the rules of the organization conduct's management, ensuring a common vision about the standards and management style, the different aspects of the Coopérnico activity. Aspects such as recruitment and proposal requests, remuneration of the members who carry out work, rules for the general meeting and others shall be incorporated. Everyone is invited to join the group and collaborate in the cooperative's management.

## 4.1. Pathways analysis

Coopérnico as a 'community energy niche' fits in Pathway B (see deliverable D1.1 of the PATHWAYS project, available at <http://www.pathways-project.eu/output>) because of potential involvement of new (border) actors as well as "real" community actors, as opposed to recognised large energy businesses. The business model is driven by sustainability goals (although financial viability must be assured). In addition, this case links up with the concept of decentralisation and the empowerment of local initiatives.

It is likely that the fast growth of this cooperative may result in additional cooperatives being created. Since this process already occurred and this type of energy market player is already common in other EU countries it should be possible to extrapolate the impact of this transition in the Portuguese energy market.

This case is an example of energy entrepreneurship and social learning, starting with a small group of people with a common and sustainable goal and working together to develop a project, creating a network, overcoming political and social challenges.

Coopérnico is a pioneer initiative in this area. In the Portuguese context, it is at the core of an emerging niche. In more detail, it is positioned as a 'community energy niche' because of its potential involvement of new (border) actors as well as "real" community actors, as opposed to recognised large energy businesses. It focuses on the target market "eco citizen": socially active citizens who are investing on new models of citizenship with capital to invest in new projects that bring financial returns.

## 4.2. Data Sheet

Data Sheet for Case Studies in PATHWAYS - WP 3 "Transitions in the Making"	
Research Institute:	FFCUL
Contact Person:	Guilherme Carrilho Graça
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Part I	
Short summary of the case (aim/character):	<p>Coopérnico is a Portuguese cooperative of renewable energy, being its mission to involve citizens and companies in creating a new energy paradigm (renewable and decentralized) for the society and environment's benefit.</p> <p>Coopérnico was founded by a group of 16 citizens from different professional areas and backgrounds, sharing a common concern: sustainable development. It defends a renewable energy and a responsible model contributing to <b>social, environmental and sustainable energy's future</b>.</p> <p>To be a member of Coopérnico it's only needed to purchase EUR 60 of equities, thus becoming developer and owner of the cooperative.</p>
Location of case:	Portugal
Website(s) of case (if applicable):	<a href="http://www.coopernico.org/">http://www.coopernico.org/</a>
Case duration: (from...to...; or: since...)	Since April 2013
Scope of the initiative (city programme, regional, city district...):	This national cooperative operates at district level, being present in 5 Portuguese districts.
Is a specific technology addressed or involved? Which?	Renewable energy technology, Photovoltaic solar energy, wind energy
Domain of the Case:	Electricity
Are there other domains of the project also addressed by your case? Which? How?	Energy Efficiency, Sustainable Communities, Cooperatives
How is your case positioned with regard to the prevailing regime or emerging niches?	<p>Coopérnico is a pioneer initiative in this area. In the Portuguese context it is at the core of an emerging niche.</p> <p>In more detail: it is positioned as a 'community energy niche' because of its potential <b>involvement of new (border) actors</b> as well as "real" community actors, as opposed to recognised large energy businesses. Focuses on the target market: "Eco citizen" seeking green solutions; socially active citizens who are investing on new models of citizenship; in people with capital to invest in new projects that bring financial returns.</p>
What is the role and contribution of the case with regard to the „PATHWAYS“-project in terms of the WPs 1,2 and 3? (Just a short comment for each.)	<p><b>This case study contributes to WP3 as a transition in the making for Coopérnico is a community energy niche with a sustainable business model involving citizens.</b></p> <p>The possible WP2 contribution results from the interaction between entrepreneurs, community initiatives and a decentralisation model for energy production.</p>

	The viability of the cooperative within the case study is the possibility of geographically replication in small scale with great flow potential (WP1).		
Where would you classify this case / this initiative in terms of the two pathways (A or B)? As a help you may first "tick" the boxes below. <sup>1</sup>	Pathway B Emphasis is B but also focus on the interaction between civil actors and governments entities (in terms of A)		
	<b>Pathway A: Technical component substitution</b>		<b>Pathway B: Broader regime Transformation</b>
Key actors	Incumbent actors (often existing industry actors and national governments)	x	New entrants, including social movements, civil society actors x
Focus of transformation	Focus on replacing technologies and management types by better ones with the same function		Technological changes are combined with wider behavioural and cultural changes x
Speed	Easier to implement in the short run		Depends on wider societal change, therefore slower in the beginning and more risky x
Depth and Scope	Changes are implemented only in as far as they meet the societal goals		Broader societal involvement and changes x
<b>Part II</b>			
Size and character of the initiatives			
Which kinds of actors and stakeholders are involved (e.g. action groups, citizen initiatives, companies, NGO's, governmental organizations, etc. Please also provide their names.	<p>The actors and stakeholders involved in initiatives are:</p> <p>_Group of 16 citizens founders of Coopéernico: Nuno Brito Jorge, Sara Ramos, Bernard Orr, João Pedro Gonçalves, Filipe Moreira Alves, Mathieu Richard, Pedro Sousa Lobo, Miguel Aroso, Leonor Orr, Duarte Marques, Carmen Estevez, José Brito Jorge, Ana Rita Antunes, Ricardo Iglésias, Susana Fonseca e Henrique Burnay;</p> <ul style="list-style-type: none"> <li>- Citizens and companies that want to be part of Coopéernico;</li> <li>- Portuguese and European cooperatives such as partners and/or funders (Biovilla, REScoop.eu, SomEnergia, Beauvent, Windenergie Waterland);</li> <li>- Solidarity institutions;</li> <li>- Municipalities.</li> </ul>		
What can we learn about the role of governance in your case? Have there e.g. been agents (individuals and/or organizations) that especially facilitated, managed or dominated the case?	<p>The creation and management of the cooperative has been in the hands of the founding members. Despite being a democratic cooperative, it needs an active and transparent leadership that makes the cooperative move forward.</p> <p>The group of Governance was created with the aim of developing a manual, practical and simple, which summarizes the rules of the organization conduct's management, ensuring a common vision about the standards and management style, the different aspects of the Coopéernico activity. Aspects such as recruitment and proposal requests, remuneration of the members who</p>		

<sup>1</sup> As addressed in the kick-off meeting we suggest that Pathway A and B represent stylized types at the end of a continuum. Your case may therefore also be „rather A or B“ instead of exactly representing one of the types. In that case, it would be very interesting to learn if there are deviations of specific interest („Focus is A but Speed and Depth work in terms of B“)

	carry out work, rules for the general meeting and others shall be incorporated. Everyone is invited to join the group and collaborate in the cooperative's management.
How much money is (approximately) involved, e.g. 1 million, 10 million 100 million euro? (if applicable) How is it financed?	10 000 – 200 000 € (each project) The projects were financed in the beginning by an European consortium (three others Renewable Energy Sources Cooperatives). Currently, the cooperative's members are the ones investing in the projects in order to pay the debt to the European consortium and boost new projects.
Which element(s) of socio-technical configurations does the initiative aim to change (e.g. technology, infrastructure, consumer behaviour, policy, cultural meaning, local infrastructure); in what way – What is the innovation?	The most important elements are the behaviours of consumers and the difficulty of raising awareness of environmental issues, the management tools of power consumption and the connection with the public and active contribution in political issues.  The innovation is based on: - Create a large community of citizens and businesses willing to contribute to a new energy, social and business model; - Improve part of the savings in investment in small renewable energy projects where each one can be owner of the part that you want; - The electricity produced is integrated into the national power grid and serves to supply families and business; - Coopérnico's projects generate economic benefits from the sale of electricity produced and environmental benefits with the clean electricity production (without CO <sub>2</sub> emissions and other pollutants) _Distribute the benefits generated between the company, investors and the environment. - Establish partnerships with other cooperatives
Please provide a short delineation of the process: Who started it? Who joined? Has there been a change in leadership? Has the case reached its goals? What were the outcomes (intended or unintended)?	The Coopérnico was founded by a group of 16 citizens from different professional areas: Three friends got together to invest their savings in a photovoltaic project, more people joined to the group later in order to invest in more solar projects and create the cooperative. Coopérnico has the mission to involve citizens and companies in the creation of the new energy paradigm for the society and the environment's benefit. Actually, anyone can join the cooperative and participate in the decisions.
Were there any policy interventions that occurred?	Since June 22 of 2015, Coopérnico became the first cooperative to commercialize green electricity in Portugal. It was a political and legal process that took several months. The cooperative is one of the 56 organizations recognized by the General Directorate of Energy (DGE) as being able to sell electricity. Although the cooperative doesn't have a role in the parliament, its opinion about feed-in tariffs was heard and weighted by the energy's general secretary.
Which barriers and conflicts did the initiative face?	There were several barriers in the cooperative development phase: - Inadequate legislative context: legal issues and the complex bureaucracy; - Inertia: resistance to new ways of energy sustainability; - Funding problems from the banks; - Lack of investment in renewables and investment in energy efficiency, since

	<p>consumption is unsustainable;</p> <ul style="list-style-type: none"> <li>- Bad reputation of cooperatives in Portugal: some cooperatives with state sponsored and proliferation of ideologically corrupt cooperative models;</li> <li>- The mistrust of the people and companies.</li> </ul>
Has the initiative found replications? (was it picked up anywhere else, planned or spontaneously)?	In Europe there are several success stories of cooperatives where more than 600,000 people belong to renewable energy cooperatives. In Portugal, there are about 2,400 cooperatives of various types. However, Coopérnico is the first and only Portuguese renewable energy cooperative.
How did learning occur within the case?	This case is an example of energy entrepreneurship. They contacted the University two years ago with the goal of establishing a traineeship program. Starting with a small group of people with a common and sustainable goal and working together to develop a project, creating a network and opening the door to a clear democracy, overcoming the political and social challenges.
Which sources of information and methods did you use in your case study?	Official information, Project's documents, media documents, interviews

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