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REPORT ON
REScoop BUSINESS MODELS

www.rescoop.eu

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ABOUT REScoop 20-20-20

REScoop 20-20-20 is an initiative launched by the Federation of groups and cooperatives of citizens for renewable energy in Europe with the support of the Intelligent Energy Europe Program (European Commission). The project is dedicated to promoting the renewable energy sources cooperative models (REScoops) and to increasing the number of successful citizen-led renewable energy projects in order to achieve the European 20-20-20 energy goals by increasing the involvement of citizens.

Twelve organisations in seven European countries (Belgium, Denmark, UK, France, Germany, Italy, and the Netherlands) have joined forces in REScoop 20-20-20. Coming from various backgrounds (renewable energy cooperatives, federations of REScoops or coops, local energy agencies, academic partners, and sustainability agencies), they all share a work experience related to renewable energy sources and cooperatives, and a tenacious desire to speed up local and citizen-led renewable energy projects across Europe.

Specifically, the project makes an inventory of the existing REScoops in Europe, learns from them, tests methodologies based on best practices and shares practical knowledge about setting up and running local and citizen-led initiatives with existing and new REScoops. It also promotes the REScoop approach to policy makers on a local, national and EU level.

The success of REScoop 20-20-20 relies on raising a collective and citizen-based dynamics around the project and the existent and upcoming renewable energy sources cooperatives. The project website (www.rescoop.eu) plays the role of an interactive platform to give REScoops across Europe a chance to pool their knowledge, effort and enthusiasm. In this perspective, all the outputs of the project (reports, guides, handbooks, etc.) are freely available on the website. A toolbox – gathering other useful REScoop 20-20-20 guides and handbooks among other interesting resources – and a Wiki are completing the set of tools made available on our interactive website.

1. INTRODUCTION AND RESEARCH CONTEXT

1.1. What is the research context?

Renewable Energy Source cooperatives (REScoops) are groups of citizens who cooperate in the field of renewable energy and participate in the energy transition. They implement a bottom-up and collective dynamic based on the active participation of citizens and the involvement of multiple stakeholders (municipalities, local economic players, other cooperatives, etc.). In this way, REScoops propose a distinct business model (compared with conventional energy companies) that promotes citizens' involvement in the decision-making processes and leaves room for multi-stakeholder engagement and dialogue.

The distinct business model of cooperatives and related forms inspired by the cooperative principles encompasses both assets and limits. This assets and limits are also applicable to the field of renewable energy and explain both why REScoops have recently emerged and developed in several countries and why their development is nevertheless limited at this stage (except for countries such as Denmark and Germany). The main originality of cooperatives, and REScoops in particular, is to provide members with different economic roles that are generally not combined in conventional companies. Indeed, citizen engaged in REScoops can be at the same time investors, producers and consumers, which brings a convergence of interests that provides several assets. For instance: (1) as cooperative members, the consumers are involved in the governance structures and have a control on the profits allocation and the applied prices; (2) when the members are both investors and consumers, increasing their number both increases the capital and the turnover, thereby improving the balance sheet structure; (3) as cooperative members, the investors/consumers have access to a transparent information about the management of the cooperative and the quality of the production (green nature of the energy), which is part of consumers/investors concerns.

Besides, by involving citizens in the process, REScoops reduce asymmetries of information, and increase social acceptance for renewable energy sources and the construction of RES facilities. Finally, REScoops appear efficient in contributing to environmental concerns by delivering 100% green energy and promoting energy consumption reduction as well as a rational use of energy.

However, weaknesses can also be identified in the cooperative model that may hinder its diffusion in the sector of renewable energy: difficulty to access capital and raise sufficient funds, difficulty to access expertise and knowledge, configuration of the socio-technical system and more particularly the pre-existing centralized grid system, lack of recognition of cooperatives by external stakeholders, etc.

In this context, the REScoop 20-20-20 project has a crucial role in fostering the assets of REScoops, sharing best practices and success stories, convincing stakeholders, and working to reduce the barriers to their development. In a complimentary way to the identification and assessment of European Best Practices and learning from existing REScoops (Work Package 2), the analysis of REScoops Business Models will contribute to identify and diffuse the various organizational options to create and develop REScoops.

1.2. What are the objectives of the REScoop Business Models report?

The Business Models report is targeted to new REScoops, potential entrepreneurs and local authorities to provide them with an overview of the REScoops business models. Building on the assessment of European Best Practices and starting from existing experiences and approaches, the objective of the Business Models report is to assess and compare extant REScoop models. Relying on

a transversal and transnational approach, the Business Models Report provides new REScoops and potential entrepreneurs with proven organizational schemes to develop citizen-based projects in the field of renewable energy.

The next section comes back on the methodology used to identify and assess the existing REScoop Business Models; methods combine qualitative and quantitative approaches. The third section briefly describes the database used for the analysis; it describes the sample in the main lines and presents the results of the descriptive analysis. The fourth section presents the results coming both from the quantitative and qualitative analysis. Particularly, the section highlights the specificities of each dimension of the Business Model, sketches some commonly found REScoop Business Models and links them with organizational lifecycle and contextual variables. Finally, the conclusion proposes a discussion of the results presented in the previous sections and identifies avenues for future research related to the REScoops, and their Business Models in particular.

1.3. What is a Business Model?

According to the literature in organization studies and more particularly the "configuration" approach, a business model is a synthetic representation identifying and combining the main dimensions that characterize an organization, i.e.:

- Mission and objectives
- Strategy
- Organizational structure and governance
- Activities – Mix of goods and services
- Financing mix
- Partnerships

2. METHODS

The methodology used to assess and compare existing REScoop models is based on an inductive approach (from data to theorization) to develop a typology of REScoop business models by combining two approaches: a qualitative approach (analysis of secondary information sources) and a quantitative approach (statistical analysis on a database).

2.1. Qualitative approach

The qualitative approach draws on the analysis of the following sources of information:

- One focus group with field actors at the EU level (partners of the REScoop 20-20-20 consortium – WP3 meeting),
- Interviews with key informants in the field,
- Scientific literature,
- Various reports at national and European levels,
- Best Practice report (WP2),
- Country reports (WP4),
- Report on financial barriers and existing solutions (WP4),
- Participant observation during the consortium meetings and various REScoops seminars, workshops and events,
- Etc.

The objective is twofold: first, these other sources of information help in identifying hypothesis to test on the database; secondly, they contribute in explaining/moderating the classification obtained through the cluster analysis by linking them with internal and external variables.

2.2. Quantitative approach

The quantitative approach consists of applying statistical analysis on a sample of REScoops. Relying on the inventory of the REScoops across Europe that sums around 650 organizations, questionnaires were passed through phone calls in order to collect more detailed information on the following dimensions: legal form, organizational structure (employees, volunteers), governance (board, general assembly), size, age, activities, types of renewable energy sources, and financial information. Complete information was collected on 107 REScoops in 7 European countries.

The statistical analysis was implemented in two steps (using the statistical software Statistica):

1. Descriptive statistics are used to describe the sample: how many REScoops? What is the distribution among countries? What are their activities? What is their size? Etc. These statistics, the first ever presented at a European level, also enable to confirm trends or illustrate observations regarding the different dimensions of the business model.

2. Cluster analysis is used to classify the organizations according to a set of variables into clusters by maximizing the similarity within each cluster and maximizing the dissimilarity among the groups in order to build a first attempt of typology of REScoop business models.

2.3. Describing the database

The database only includes the REScoops for which a complete and updated profile was available at the end of 2012. This sample includes 107 Renewable Energy Source cooperatives from 7 European countries. The sample is not representative of the European population of REScoops; therefore the results cannot be generalized for the whole population but they can already give some trends regarding the whole sector.Therefore, by completing the information on the 500 or more REScoops identified but without full details, a more accurate picture will be available.

The following tables give the sample distribution regarding the countries, the energy sources used, the numbers of members, volunteers and workers, and the age.

Country distribution	
Belgium	1
Italy	10
Netherlands	22
Spain	3
Sweden	1
UK	30
Germany	40

Energy sources	
Biomass	12
Wind	34
Solar	62
Geothermal	1
Hydro	10
Tide	0
Natural/Biogas	4

Volunteers/workers	
With paid workers	36
With volunteers	62

Number of members	
0 up to 50 members	15
51 up to 100 members	15
101 up to 150 members	15
151 up to 200 members	7
201 up to 250 members	5
250 up to 300 members	8
301 up to 500 members	8
501 up to 1000 members	12
1001 up to 1500 members	4
1500 up to 5000 members	6
22414 members	1
43308 members	1
No information	10

Age	
0 up to 5 years	69
6 up to 10 years	9
11 up to 15 years	4
16 up to 20 years	2
21 up to 30 years	10
31 years up to 100 years	3
More than 100 years	3
No information	7

3. THE RESCOOP BUSINESS MODELS

Looking deeper in the literature around renewable energy cooperatives and community power organizations, it rapidly appears that REScoops are diverse in terms of the ownership and governance structure, organizational structure, scale of activities, type of activities, energy sources used, financing mix, etc. As we will see, to be a cooperative or a group of citizens on one hand and to be active in the renewable energy field on the other hand have already some implications on the business model. The following sections review these implications and the diversity of REScoop models while linking the various dimensions of the business models to each other, *i.e.* the mission and objectives, the strategy, the organizational and governance structures, the activities, the financing mix and the partnerships. Combining these different dimensions, a typology of six categories is highlighted and connected with contingent variables such as organizational lifecycle and socio-cultural context.

3.1. What are the implications of being a RES/coop on the Business Model?

The REScoops are groups of citizens inspired by the ICA cooperative principles and active in the field of renewable energy. Briefly, combining these two specific features already has implications on the business model.

The REScoops share the cooperative values:

- The voluntary and open membership invites to gather multiple actors around the cooperative project, which can lead to multi-stakeholder governance structures and will allow gathering various skills and experiences enhancing the social capital of the REScoop.
- The democratic member control implies implementing democratic decision-making procedures (often on the basis 'one person, one vote') and recognizing the equality and potential contribution of each to the project.
- The members' economic participation implies a particular financial relationship between the REScoop and its member and has an influence on the financing mix.
- The autonomy and independence do not prevent partnerships but sanction the need to remain autonomous, particularly from political authorities.
- The focus on education, training and information implies the setting-up of transparent procedures and the importance of educating and accompanying the members, but also the community, on the issues relevant to REScoops.
- The cooperation among cooperatives fosters partnerships with other actors sharing the same philosophy.
- The concern for community implies a mission that goes beyond the sole production and distribution of energy to turn its focus to benefits to the community.

The REScoops are active in the renewable energy field:

- REScoops participate in the movement of energy transition from fossil and nuclear energy towards renewable energy. In line with this transition approach, REScoops promote bottom-up approaches and the involvement of citizens. They also promote another use of energy and energy savings, which implies that the organizational model is not based on selling as much as possible to their customers.
- REScoops promote an energy system based on local actors, if possible producing locally for local customers.
- Developing renewable energy projects, particularly for medium-sized or big projects, requires setting up partnerships with various actors (private companies, public entities, local authorities, social enterprises, etc.) regarding the financing-mix (to collect the required

money), the production (to have access to installation sites and develop projects such as wind parks), and the supply or even distribution (to have access to the grid).

3.2. What are the important dimensions of the Business Model and their specificities?

Dynamic of creation

One common dynamic of REScoop creation results from a group of citizens at a local level who make the decision to launch something together in the renewable energy field. This bottom-up approach comes from the citizens and little by little develops and possibly includes other types of actors in the dynamic. This can be referred to as a bottom-up or centrifugal approach that starts from a small number of citizens to scale up towards larger size and inclusion of other partners.

However, REScoops can also be created from the impulsion of an existing actor (NGO, municipality, REScoop developer, etc.). This actor then starts the project "from the outside" and connects together different actors including citizens, public actors, private companies, and other actors. This can be referred to as a top-down or centripetal dynamic that starts from an external initiative to reach the citizens.

In both cases, the motivation to take part in or set up a REScoop results from a need: a need for (more) renewable energy, a need for community appropriation of energy issues, a need to empowerment counterbalancing the dominance of private corporate companies, etc. The REScoop creation can also (and often additionally) result from an opportunity, for example when a wind park is developing and the project developers offer the citizens the possibility to organize themselves and acquire one or several wind turbines. The primary motivation – being more driven towards a need or an opportunity– will have an influence on the reasons why and the way citizens and other actors organize themselves to create the REScoop; it will also determine the scale of the activities and whether the REScoop will keep local or not.

Vision, mission and objectives

Taking part in the energy transition movement, the REScoop business models are guided by three objectives:

- Fostering citizen involvement: citizens and local community directly control and benefit from the REScoop activities;
- Reinforcing the local economy: the local use of resources that are often common goods contributes to the local economy and allows the community to directly benefit from the exploitation of these common goods (instead of leaving the money going out of the community);
- Aiming for environmental efficiency: REScoops help their members/consumers to reduce their energy consumption and to engage in environmental-friendly action.

As cooperatives or organizations inspired by the cooperative principles, REScoops serve their members as well as the broader community. Profitability and maximal return on investment for shareholders are not the central driving force of the REScoops; rather they organize their activities to meet the needs of their members. REScoops also ensure transparency regarding their activities (where does the energy come from? What is the efficiency of the RES facilities? What are the profits and how are they allocated? Etc.)

In return of their investment and commitment in the REScoop, the members can participate in the decisions, consume their own energy (in some cases) and benefit from fair returns on their investments. The community orientation and drive towards long-term sustainability rather than

short-term profits are “secured” by the limited profit distribution inherent in the cooperative or related social enterprise forms. Thus, dividends are at least partly reinvested in the project and to the benefit of the community, and not primarily to shareholders.

Governance and organizational structure

REScoops are either formal cooperatives (adopting the cooperative legal form) or groups of citizens that organize according to the cooperative principles. Regarding the legal forms, every European country has its own legal forms that frame with the cooperative principles (see the Country reports for an exhaustive view of the existing legal forms and their specificities). In the current sample, a large majority of organizations are formal cooperatives (see table below); yet groups of citizens or community organizations active in the renewable energy field are also numerous, though probably less visible.

Database: Legal form distribution	
Cooperative legal form - Coöperatieve vennootschap met beperkte aansprakelijkheid (BE) - Società Cooperativa (IT) - Coop (NL) - Non-profit cooperative (ES) - Cooperativa de consumidores y usuarios (ES) - Kooperativ (SW)	75
Public Company (IT)	1
Private Limited Company Ltd (IT)	1
Industrial and Provident Society (UK)	14
Limited Liability Partnership (UK)	1
Community Benefit Society (UK)	1
Community Interest Company (UK)	1
Charity (UK)	3
Company Limited by guarantee (UK)	1
Further education college (UK)	1
No information	8

The members of REScoops can wear multiple hats combining ownership, investment and use. Each hat is associated with specific roles and decisions:

- By acquiring shares, they become **owners** of the REScoop and therefore participate in the control of the organization.
- By acquiring shares, they also become **investors** and in this respect, they may expect a return on their investment, being financial and social/environmental.
- By their economic participation, they become **users** of the REScoop and get the right to ‘use’ its services. Some REScoops are more closely associated with one economic function such as consumption, production or work (bringing them close to traditional cooperatives of consumers, workers or producers). Other REScoops combine different economic usages (production and/or consumption and/or work).

Some REScoops offer the opportunity to freely choose between different hats; others impose some restrictions. For example, some REScoops impose to be a member to also become a consumer, each new member thus bringing in both capital and turnover increase. Other REScoops offer the possibility to be only an investor without using the services as a producer or a consumer, which enables to attract investors from outside the supplied area. Finally, some REScoops offer the opportunity to be a consumer without investing in the REScoop, which allows enlarging the base of the customers.

Because of the open and voluntary membership, REScoops are also expected to engage into dialogue with local stakeholders. This often leads to a multi-stakeholder governance structure. While citizens are generally the primary category of stakeholders that are represented in the governance structures, other stakeholders often intervene such as municipalities, local nonprofits and NGOs, other cooperatives or private companies (see table below). For example, in the new Italian REScoops, grid operators become members of the cooperatives, besides local citizens.

Database: Types of members	
Citizens	92
Private companies (energy providers, banks, grid operators, etc.)	53
Social enterprises (other cooperatives and nonprofits, etc.)	35
Public entities (municipalities, regional authorities, etc.)	38
Workers and employees	25
Credit Unions	1

Some REScoops also apply restrictions on the type of members; typically geographical restriction either to ensure the local anchorage of the REScoop or for legal reasons (see table below). Other restrictions can be identified; for example:

- To only accept citizens as members;
- To put a minimum age to become a member;
- To only accept national or local companies;
- To limit the number of shares per member;
- To pay the membership fee;
- To only accept as partner companies those that follow social, ecological and ethical standards;
- Etc.

Database: Geographical restriction on membership	
Local restriction	27
Regional	14
National restriction	27
No restriction	28
No information	11

The cooperative principles also highlight democracy as the way to organize the decision-making processes, particularly in the general assembly. The most common principle in this respect is “one member, one vote” (see table below). Nevertheless, adaptations to this principle exist, for instance different types of shares (see below), or additional votes for each given period of membership.

Database: Distribution of power in the general assembly	
Not applicable	6
One member, one vote	89
Representation linked to the number of shares	2

REScoops that gather various types of members can apply different types of membership with different voting rights. This is for instance the case of new Italian REScoops where citizens and grid operators, both cooperative members, do not have the same voting power.

The reverse side of the democratic coin is democratic entropy, which means a deterioration of the democratic functioning of the organization in terms of the representativeness or the participation of

the members. For example, the Best Practice report highlights that a REScoop with many different legal entities will be less transparent and less attractive to members who will have more difficulties in understanding their role and power in the structure.

Next to the general assembly, REScoops function with a board of directors. The board is elected by the general assembly: it represents the cooperative members and participates in the management of the REScoop – this is even more the case in REScoops that do not function with paid workers. In larger REScoops, the board of directors will assume a more strategic role, acting as the architect conceiving the strategy and monitoring its implementation. In terms of board size, the database analysis indicated that 88% of the REScoops have a board of composed of 10 directors or less.

In terms of workforce, most REScoops function with a small number of employees or without employees at all (see table below).

Database: Number of Employees (in full time equivalent)	
0 employee (FTE)	56
0 – 1 employee (FTE)	15
1 – 5 employees (FTE)	12
6 – 15 employees (FTE)	5
More than 15 employees	4
No information	15

REScoops can also generally count on a large number of volunteers (see table below) active in various types of activities, during the setting-up as well as during the development phases. Volunteers constitute the social capital of the REScoops, by bridging major resources: skills, experiences, expertise and knowledge, networks, contacts, free time, creativity, etc. As stated in the Best Practice report, the time and resources brought by the members and volunteers to the REScoops are most valuable assets even if they do not appear in the balance sheet. Besides their active working contribution, volunteers can bring connections with stakeholders and networks, and increase the democratic vitality by participating in the formal and informal governance structures.

Database: Number of Volunteers	
0 volunteer	23
1 – 10 volunteers	29
11 – 20 volunteers	19
21 – 50 volunteers	8
51 – 100 volunteers	3
More than 100 volunteers	3
No information	22

Activities – Goods & services

Besides different types of economic activities (see Missions and Objectives), REScoops are at different phases of the project development: (1) the pre-planning and feasibility studies for possible development, (2) the exploitation, and (3) the supply of renewable energy. Some REScoops are specialized in one or two phases (this is the case for example of Energy4All) while most are active throughout the different phases (e.g. Ecopower).

The production, supply and distribution of energy concern electricity and/or heat, with a predominance of the former over the latter.

- **Production of renewable energy** (electricity and/or heat): Many REScoops (e.g. Middelgrunden, Windvogel, Energy4All, etc.) produce renewable energy from various renewable energy sources: wind, sun, water, geothermic, biomass and natural gas. In our database, 67 REScoops are producing electricity and 12 REScoops are producing heat. Regarding the energy sources, the wind and the sun are the most used energy sources; the water and biomass are less developed; and the geothermic source and the natural gas are even less frequent (see table below). The producers can sell their energy to a supplier of energy or directly to customers (in which case the producer is also supplier of energy).

Database: Energy source distribution	
Biomass	12
Wind	34
Solar	62
Geothermal	1
Hydro	10
Tide	0
Natural/Biogas	4

- **Supply of renewable energy** (electricity and/or heat): Some REScoops (e.g. Ecopower, Enercoop) supply renewable energy, either directly to their members or to the market, the customers being members or not of the REScoop. The supplying REScoops either produce the energy supplied through their own RES production facilities or buy part of the energy to other green energy producers. In our database, 37 REScoops are supplying electricity and 16 REScoops are supplying heat. 12 REScoops supply their members only, and 17 REScoops supply all consumers either members or not.

- **Distribution of renewable energy** (electricity): Only a few REScoops (e.g. EWS, E-Werk Prad) distribute renewable energy to the customers, which implies that these REScoops own their proper grid. Owning part of the grid is not common, especially in centralized energy system where the grid is often entirely owned by public entities. Owning a grid often results from historical reasons (e.g. old Italian energy cooperatives), from pragmatic reasons (e.g. peninsula REScoops) or from legal or ecological reasons because it was the only possibility to offer another kind of (green) energy (e.g. EWS). In our database, 50 REScoops are connected to the public electrical grid and only 4 REScoops own their own grid.

Finally, REScoops also develop other services. Some REScoops (e.g. Ecopower, Energy4All) develop consultancy and support services, or bring risk-capital for new initiatives in the field of renewable energy; they can also be active in energy savings activities or collective buying (of photovoltaic for example) for their customers or in developing more integrated approaches including societal dimensions (habitat, mobility, etc.). In our database, 21 REScoops are developing other such activities (collective buying, climate protection, reforestation, supporting and facilitating the creation of REScoops, advice, promotion of renewable energy, local awareness programs, energy efficiency, training, etc.).

The Business Models are characterized by various combinations (or not) of these activities: some REScoops remain on one type of activity and one renewable energy source (e.g. a community watermill or the provision of renewable heat from local fuel supply to heat a community-owned swimming-pool); some other REScoops either combine various types of activities (for example, Ecopower not only produces and supplies renewable energy but it also delivers support services to

new REScoops) or combines various renewable energy sources (e.g. a windmill and photovoltaic installations). In our database, 27 REScoops combine two or more renewable energy sources and 25 REScoops combine production and supply activities. It is clear that the renewable energy sources greatly influence the REScoop business model: for example, photovoltaic panels that are installed on individual roofs will not lead to the same type of REScoop as a windmill supplying a community or a farmer cooperative.

Financing-Mix

The REScoop financing-mixes are diverse and of course highly linked to the activities. The different phases of the development of projects require different types of resources: the pre-planning and study phase require venture capital while the setting-up and building of production installations require capital and loans. The nature and scale of the project also influence the financing-mix: developing a wind park obviously requires much more starting capital (even with loans) than developing photovoltaic panels or consultancy services towards REScoops.

The financial resources come from various sources, as developed in Work Package 4:

- Self-financing: it concerns the shares acquired by members and/or the loans from members
- Bank loans from traditional and/or cooperative and ethical banks
- Subsidies in capital and/or in investment from public funds
- Capital and/or investment support from private funds
- Venture capital from REScoops developers

Given the high costs to develop the activities, REScoops generally combine in innovative ways different financial contributions from the citizens, public entities and private organizations. The table below shows the financial resources for the REScoops of our sample. Some other financial resources have been identified, such as crowdfunding, grants, members' donations, revolving fund, etc.

Database: Financial resources	
Shares	72
Loans	59
Public subsidies in capital	18
Public subsidies in investment	5
Private subsidies in capital	11
Private subsidies in investment	5

Finally, as organizations inspired by cooperative principles, the members decide themselves of the use and the allocation rules for profits. Most of the REScoops distribute a dividend to their members (the average of our sample is 3,5% on the last five years); some of them also remunerate the members through other ways, for example by selling them the energy at favourable prices (with a maximum amount of kWh/year).

Partnerships

Partnerships are part of the REScoop Business Models, for pragmatic reasons (to develop the activities, especially for medium-sized or big projects) or for philosophical reasons (to foster cooperation among organizations). Partnerships occur both in the setting-up and development phases of the REScoop with various types of actors: private companies, public entities, local authorities, social enterprises, cooperatives, REScoops, etc.).

Partnerships mainly take place in the following areas:

- Financing-mix: Partnerships occur to collect the required money to set up the REScoop and/or to develop the projects. The partnerships can take the form of contributions to the capital, investment or loans.
- Production activities: to have access to installation sites and develop projects such as wind parks.
- Distribution activities: to have access to the grid – contract with market operator.
- Maintenance of the installations.

In concrete terms, these partnerships materialize through different ways:

- Membership: In some cases, the partners become members of the REScoop and contribute to the capital, with the same or different voting rights than the other members. This is the case, for example, of the grid operators becoming members of the new Italian RES cooperatives.
- Agreement/contractual relationship: The partnership can conduct to the conclusion of an agreement between the partners who become linked by a contractual relationship. The agreement generally has a fixed period and is about specific and precisely defined points. Agreements are for example concluded to organize maintenance or grid-access partnerships.
- Consortium: The partnership can lead to the setting-up of a consortium gathering the various actors: it can be the case for example in the setting-up of a wind parks with private, cooperative and public actors involved.

3.3. Combining the Business Model dimensions

Combining the various dimensions of the Business Model developed in the previous section, *i.e.* the dynamic of creation, the vision, mission and objectives, the governance and organizational design, the activities, the financing-mix and the partnerships, six different Business Models can be identified. This typology emerges from the cluster analysis as well as from the qualitative analysis.

Introduction to the cluster analysis

The idea of the clustering techniques is to classify the individuals into clusters in order to maximize the similarity within each cluster and to maximize the dissimilarity among the clusters. Relying on the calculation of distances among individuals, the clustering techniques offer an exploratory tool to classify the individuals but they do not suggest the reasons underlying the classifications.

The first step consists of realizing a principal component analysis (PCA) in order to reduce the number of variables to take into account in the cluster analysis. We applied the principal component analysis in order to obtain a size factor: the results lead to keep two principal components: a 'size factor' and a factor reflecting the number of Full Time Equivalents. The detailed results of the PCA are presented in appendix 1.

In order to apply the cluster analysis, we recoded the information to reduce the number of variables to take into account. Here are the variables we kept for the cluster analysis:

- Age
- Size factor
- FTE factor
- Activity
- Types of members
- Geographic restriction on members
- Distribution of power in the General Assembly
- Types of financial resources

Variables such as the country and energy source(s) are obviously not considered in the cluster analysis because they are not related to the business model construct.

A typology of REScoop Business Models

While the cluster analysis provides a large number of possible categories, the number of categories relevant to retain, and the interpretation of the content of each category, depend on the qualitative analysis. Based on the combination of quantitative and qualitative analyses, a typology of six Business models can be built.

BM1 – Local group of citizens

The BM1 REScoop is born from a group of citizens in a bottom-up approach with the motivation to fulfil a need they have identified. The REScoop keeps a small size and develops small local projects, such as solar panels or a watermill. The REScoop mainly functions on volunteering without employees. They have a limited capital and the financial resources mainly come from the members (shares, loans). Typically, a group of citizens who decide to renovate a watermill in their village in order to produce electricity enters in this category.

BM2 – Regional-national REScoop

The BM2 REScoop is either born from a group of citizens that has scaled up or from an external initiative that gathered the relevant actors together. The motivation was either to meet specific needs or to take up opportunities. The objective is to develop a mix of activities and/or to be active on various energy sources. They generally develop different projects at a regional or national level with different production sites. They function with volunteers as well as employees for the operational issues. The financial sources are more diversified and they develop partner relationships on different matters. Typically, a REScoop that develops photovoltaic projects and wind projects at the level of a country enters in this category.

BM3 – Fully integrated REScoop

The BM3 REScoop is a fully integrated business model in terms of services: production, supply, distribution when possible, and other services. This is an advanced model that results from a quite long organizational trajectory. The objective here is to function independently on the different dimension of energy provision. These REScoops function with employees as well as with volunteers. Typically, the grid-owning cooperatives, such as the old Italian energy cooperatives or EWS, enter in this category.

BM4 – Network of REScoops

The BM4 REScoop business model is a network or a group of REScoops. A REScoop developer or incubator puts venture capital in new project and develops autonomous REScoops at the local level on the same business model. The scaling up strategy relies on the replication of a proven and successful organizational scheme in various localities, which permits scales of economies, time and energy in developing the projects. They also develop the same types of partnerships, both at the local and meso levels. Typically, this is the Business Model implemented by Energy4All.

BM5 – Multi-stakeholder governance model

The BM5 REScoop is what can be called a multi-stakeholder governance model. The REScoop gathers all the stakeholders who have a role to play in the provision and consumption of renewable energy (consumers, producers, workers, communities, partners) through a complex governance structure. The REScoop governance model can be organized at the local level (with local multiple stakeholders) or at the level of a territory with a pyramidal structure from the local to the territory level. Typically, this is the business model of Enercoop.

BM6 – Non-energy-focused organization

This category includes different types of projects initiated by a local actor whose main focus is not energy production or supply. Typically, existing cooperatives (such as farmer cooperatives), local education institutions or nonprofits developing a citizen-based renewable energy activity as a side project complementary to their activities enter in this category. Community organizations responding to different needs within the community (energy but also housing, mobility, education, etc.) are also typical of this model. The funding is then provided by the host organization, either through its own funds or through a larger contribution of citizens or other stakeholders. The renewable energy project can serve energy saving purposes but it can also be a vehicle for education and awareness-raising (for instance when schools or other local institutions want to concretely showcase how the energy transition they advocate for can become a reality).

3.4. Business Models and organizational life-cycle

In terms of lifecycle, it appears that the first three Business Models (BM1 – BM2 – BM3) can form an organizational trajectory when the objective of the REScoop is to scale up (which is not always the case especially when the local anchorage is a primary concern). The organizational trajectory towards a larger scale and a broader portfolio of activities (including renewable energy sources) goes parallel with a complexification in the activities but also in the partner relationships and in the multistakeholder structure of the REScoop. This is confirmed in the case studies:

- Some REScoops intentionally begin with small projects relying on one renewable energy source, such as installing solar panels on the roof of a school for example, so as to start and accumulate money to add more activities, launch larger projects afterwards or to diversify the types of renewable energy sources.
- Resulting from these observations, the financing-mix appears linked to the organizational lifecycle, with the REScoops first counting on self-financing for small projects before being able to ask loans and other forms of financial resources to private and/or public partners.

3.5. Business Models and contextual variables

The qualitative approach enables to identify some contextual variables that will influence the Business Models:

- A positive and stable RES policy context has been a large driver for REScoop development (see Denmark or Germany). On the contrary, a centralized energy policy and/or historical dominant actors are less favourable for REScoop development (Spain, France, etc.).
- Energy policy that allows REScoops accessing to the grid and distribute energy directly to the users is a crucial step for fostering REScoop development.
- A political recognition of REScoops as relevant and useful institutions is a positive element. Linked to that point, the cooperation among various political levels (local, national, European) and citizen RES projects is another success factor.

- Cultural and normative frameworks influence the success of citizen-based/participatory organizational models: the way in which the project is framed to attract support from citizens and other stakeholders varies a lot according to the countries (for instance the use of the word “cooperative”, the connection with energy transition, the funding scheme, the partnerships, etc.).

4. CONCLUSION

The Business Model report is a first step in studying the ways through which REScoops organize themselves to deliver services in the renewable energy field. The diversity of organization models and practices has been highlighted on a number of key dimensions: the mission and objectives, the strategy, the organizational and governance structures, the activities, the financing mix and the partnerships. Descriptive statistics have been proposed for each of these dimensions based on a sample of more than 100 REScoops in 7 European countries.

Combining these different dimensions through both statistical and qualitative analysis, a typology of six categories has been highlighted and connected with contingent variables such as organizational lifecycle and socio-cultural context. The six categories are: local citizen groups (BM1), regional-national REScoops (BM2), fully integrated REScoops (BM3), networks (BM4), multi-stakeholder models (BM5), and non-energy-focused initiatives (BM6). While a broader sample could help to refine and restructure these categories, discussions within and outside the project consortium seem to make sense of this typology as one possible (although not only) way to structure the diversity of REScoops across Europe.

Of course, the research faces limitations, each of which opens avenues for future research. First, we used a sample of 107 REScoops to identify trends on the organizational behaviours of REScoops. Extending the sample to a larger proportion of the whole REScoop population would enable to use more robust statistical techniques and lead to results that could be more easily generalized. This is why the effort of identification of REScoops across Europe and collection of detailed data should be pursued, not as a one shot but through regular monitoring (annual surveys) in order to trace the evolutions over time. Such evolutions would include the performance of REScoops (viability, legitimacy, scaling up, etc.) in order to enable benchmarking within each model as well as among the different models.

Secondly, each dimension of the Business Model could be more deeply analyzed, particularly with qualitative approaches, to have a better idea of how the REScoops function:

- Mission and objectives: what are the primary motivations to launch a REScoop? How is the strategy defined? And implemented? Etc.
- Governance: what are the governance structures in place in the REScoops? How are they functioning? Who is doing what?
- Financing: when is which financial resources used? For what kind of projects do they use what kind of financial resources? Etc.
- Cooperation and partnerships: what are the collaborations among RES cooperatives? Among cooperatives? With other partners? How knowledge and other resources are shared through these partnerships? What are the successful factors of these partnerships and how do they materialize on the field?
- Etc.

Finally, as for every kind of organizations, the institutional and regulatory environments are crucial in explaining the REScoop organizational arrangements and the variations among countries. To examine more deeply the interaction between the REScoops and their context, detailed country-level analyses would be helpful to understand which models work better and when or where, so as to provide recommandations to foster REScoop development in new countries.

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APPENDIX

Appendix 1: Results of the Principal Component Analysis

We applied a principal component analysis on the following variables in order to reduce the number of variables and determine a "size factor" (if possible):

- Number of members;
- Number of volunteers;
- Number of full time equivalent;
- Total of the balance sheet;
- Amount of capital invested by citizens.

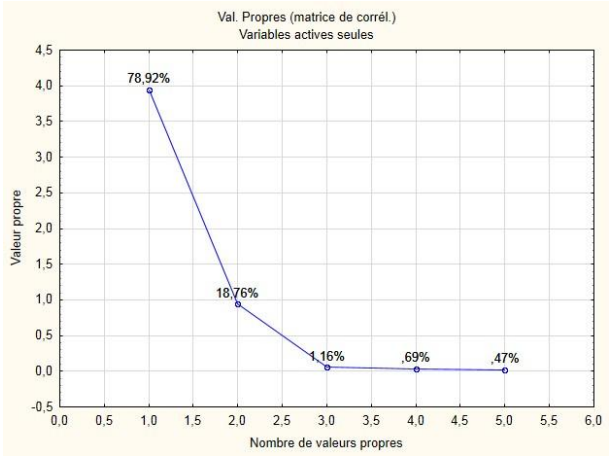
The variables are expressed in different units; we worked therefore on the correlations matrix, *i.e.* the matrix of covariance of standardized variables. For the rows for which the information on the five variables was not complete, the missing information has been replaced by the mean. The results of the PCA are presented in the tables below.

The first table gives the eigenvalues associated to each component. We observe that the first component explains about 79% of the variation; it is therefore preferable to add the second component to reach 97,7% of variance explained and have most of the information being summarized by the two first components.

EIGENVALUES AND VARIANCE

	Eigenvalue	Percentage of variance (%)	Cumulated percentage of variance (%)
Component 1	3,945767	**78,91534**	78,9153
Component 2	0,938065	18,76131	**97,6766**
Component 3	0,057974	1,15949	98,8361
Component 4	0,034715	0,69430	99,5304
Component 5	0,023478	0,46957	100,0000

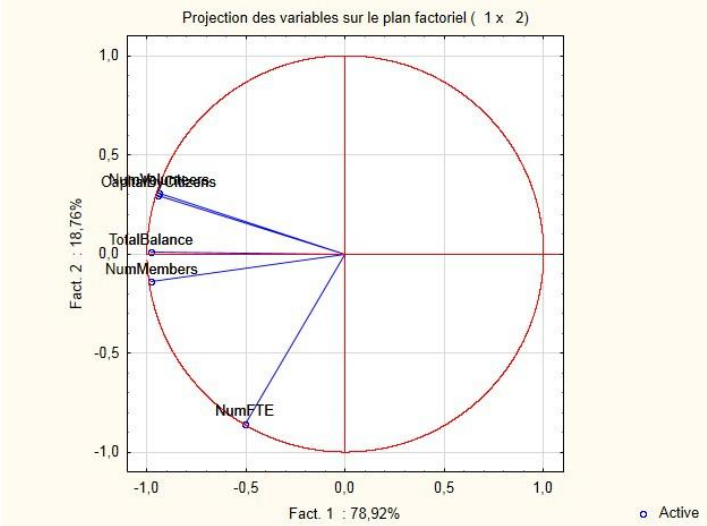
This result is also visible on the screeplot of the eigenvalues: the 'elbow-effect' that we observe after the second eigenvalue confirms that taking into account the two component is necessary to summarize most of the information.



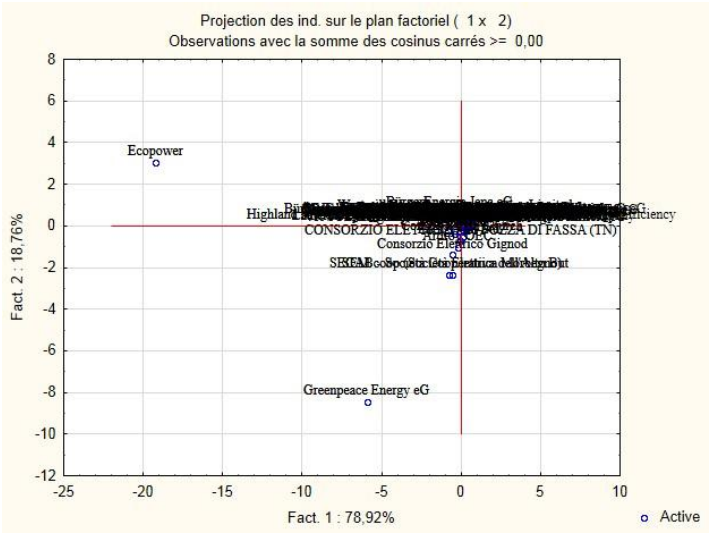
Besides, the analysis of the factorial coordinates and of the projections of the variables on the two first components allows appreciating the weight of original variables in each component in order to interpret them. We can see that the first component is highly correlated with the variables NumMembers, NumVolunteers, TotalBalance and CapitalByCitizens while the second one is highly correlated with the variable NumFTE. We can therefore interpret the first component as a 'size' factor and the second one as reflecting the number of Full Time Equivalent. Following these results, two new variables – 'ACP-Size' and 'ACP-FTE' – are therefore created in the database with the new coordinates for each individual.

FACTORIAL COORDINATES OF THE VARIABLES

	Component 1	Component 2	Component 3	Component 4	Component 5
NumMembers	-0,977828	-0,142033	0,057593	0,116871	0,081872
NumVolunteers	-0,940302	0,306097	0,100939	0,024989	-0,106413
NumFTE	-0,507500	-0,858603	0,035769	-0,055277	-0,030170
TotalBalance	-0,978280	0,008717	-0,205155	0,014272	-0,024478
CapitalByCitizens	-0,943855	0,294826	0,033180	-0,131044	0,062786



Finally, we can also have a look on the projections of the individuals on the two first components to see how they behave compared to each other on these two components. Two observations – Ecopower and Greenpeace Energy - appear as outliers and don't behave like the others in terms of size. If we compare the numbers, they indeed present much greater numbers than the others.


Projection des ind. sur le plan factoriel (1 x 2)
Observations avec la somme des cosinus carrés >= 0,00
Ecopower
Greenpeace Energy eG
Consorzio Elettrico Gignod
Fact. 2 : 18,76%
Fact. 1 : 78,92%
Active