

STATUS AND EVOLUTION OF THE COMMUNITY ENERGY SECTOR IN ITALY



COllective action Models for Energy Transition and Social Innovation



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Presentation outline

- Defining community energy
- Evidence on community energy in Italy
- Concluding remarks



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Defining community energy

- Transition toward **renewables** and **decentralized energy systems**, progressive **liberalization** of energy markets have left space for an **active role of energy users**, which are turning into “prosumers” or co-providers of energy services
- Community energy initiatives emerge as a form of **citizens participation** in the energy transition
 - Propose a different model of development and ownership of energy projects and services than traditional business organizations
- Civil society engagement can take several forms, quite heterogeneous sector
 - Grassroot associations, collective purchasing of energy service, community programmes for poverty alleviation, energy production and energy distribution cooperatives, or a mix of those
- Different definitions in academic literature. Most commonly concentrate on energy communities:
 - Which imply a form of **citizens ownership or financing** of the energy project.
 - Where **citizens directly benefit** from the outcomes of the initiative.



Historical coop vs modern community energy (CE)

- The first CE initiatives date back to early 20th century, when rural electrification cooperatives existed in Europe in countries such as Germany, Italy, or Spain
 - Cooperatives to produce and provide electricity to its members
- Later associated with renewable energy production with the rise of wind cooperatives in Denmark in the late 1970s and with new waves of citizens' initiatives after Chernobyl disaster in 1986 (in particular in Germany and Belgium).
- It is from the 2000s, with the transition toward decentralised and cleaner energy systems, that they began emerging as new paradigms of people engagement in the energy sector



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More developed in Northern Europe

- CE initiatives are more common in Northern Europe, particularly in Denmark, Germany, and the United Kingdom, and far less developed in Southern Europe.
- Germany hosts more than 800 energy cooperatives, accounting for about 34% of the citizenship [Yildiz, Ö., 2014]
- South European countries like Spain or Greece less than 10 initiatives have been reported [Capellan-Perez, I. et al 2018, Rescoop, 2012].
- Most of the academic literature researching dynamics, drivers, and conditions for implementation of CE initiatives mainly focus on Northern European countries [Bauwens, T. 2016, Boon, F.P. 2014, Seyfang, G., 2013, Wierling, A, 2018].



Fontanone hydroelectric plant Paluzza, 1913



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Historical evolution

- In the alpine region several local cooperatives were able to build hydroelectric plants and the distribution grid (e. g. Società per l'Illuminazione Elettrica in Chiavenna, 1894)
- During the nationalisation (ENEL was founded in 1962) most of the cooperatives were included in the national vertical integrated (almost) monopolistic utility
- A number of them refused to join the national utility and continued their own activities even after the liberalisation process started in 1999 with the implementation of the EU Directive 96/92/CE concerning common rules for the internal market in electricity
- They are very specific and currently not replicable cases, functioning as a group of special legal status which in particular allow them to own and manage the local distribution network.



Alpine communities

Historical electric cooperatives



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Main objectives

- Contributing to the community energy literature by mapping community energy sector in Italy
- Identifying typologies, dynamics of creation, activities
- Initial assessment of citizens participation (co-determination) and enabling conditions
- Focus on 'new wave' of EC initiatives:
 - Developed since late 2000s, with a focus on renewables
 - Operate in liberalized energy market
 - Which imply a form of citizens ownership or financing of the energy project.
 - Where citizens directly benefit from the outcomes of the initiative.
- Not included:
 - Other forms of civic engagement (green associations, local development initiatives/ecopreneur and ethical consumerism)
 - Historical cooperatives (not replicable)



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Candelise C, Ruggieri G, 2020, Status and evolution of the community energy sector in Italy, Energies, Vol: 13, Pages: 1-22

Materials and methodology

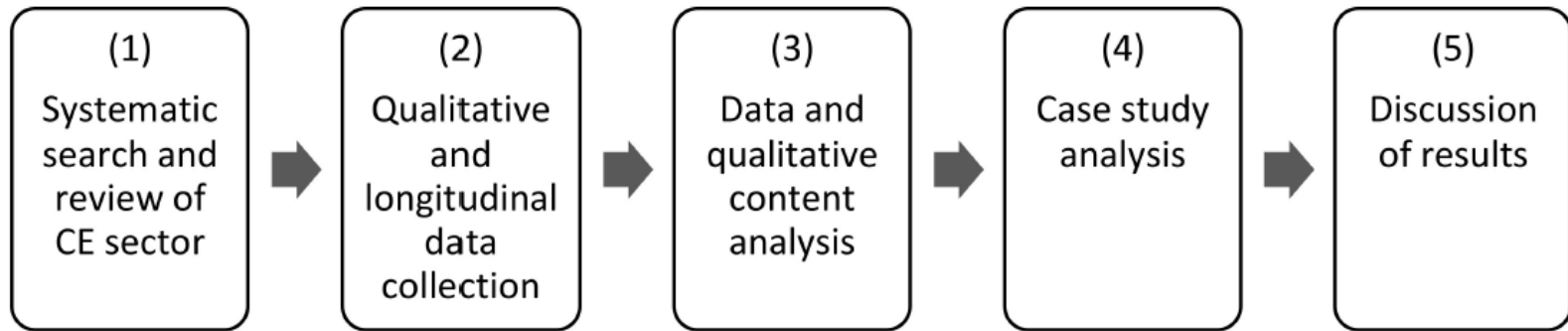
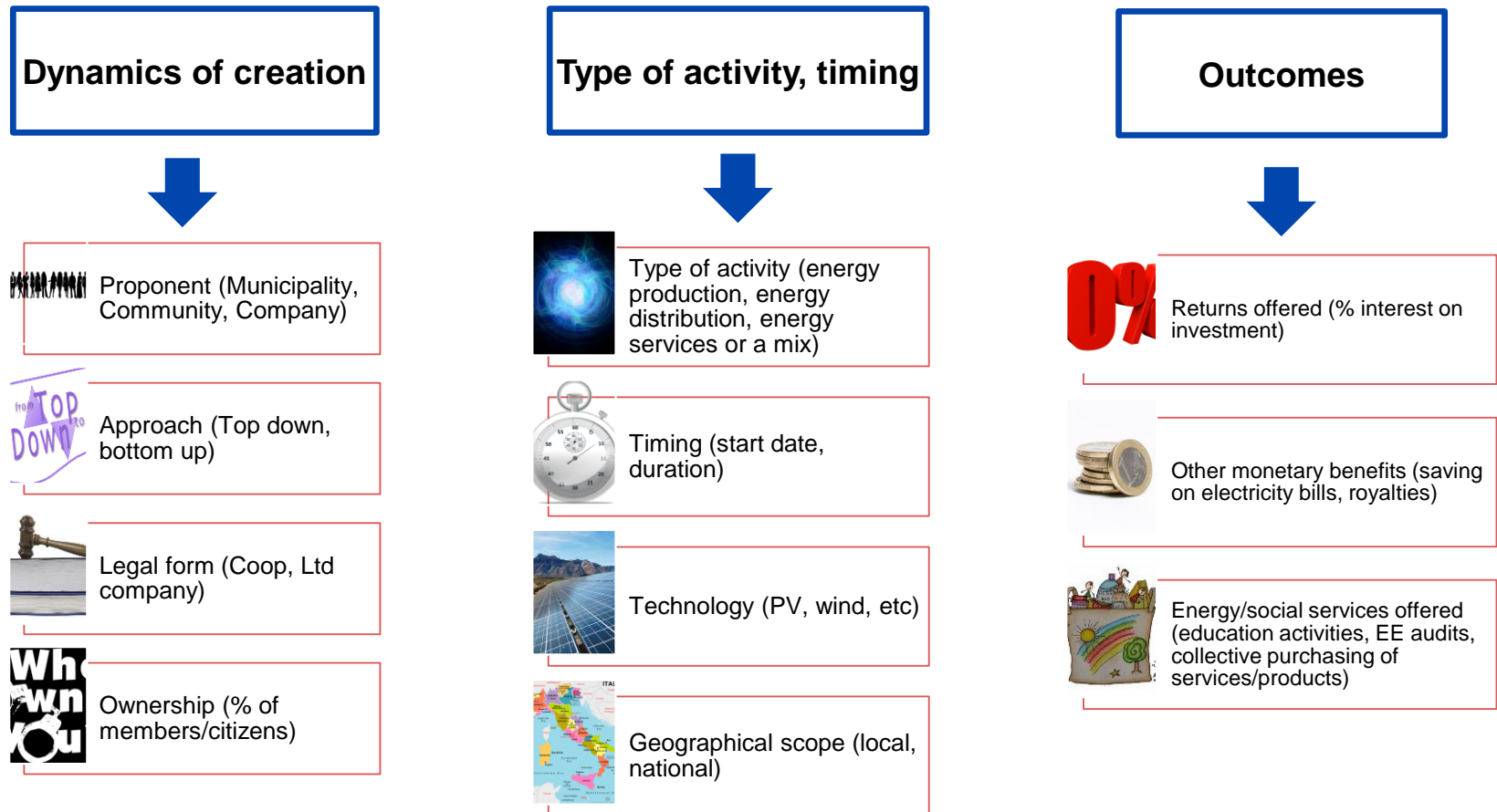


Figure 1. A stepwise approach to investigate Italian community energy (CE) sector.

1. 17 Italian CE initiatives identified through systematic web searches, grey literature and stakeholders engagement
2. Data collection - semi structured interviews
3. Analysis of evidence – emerging trends
4. Case studies (sample too small for quantitative analysis)



Data collection



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EMERGING EVIDENCE

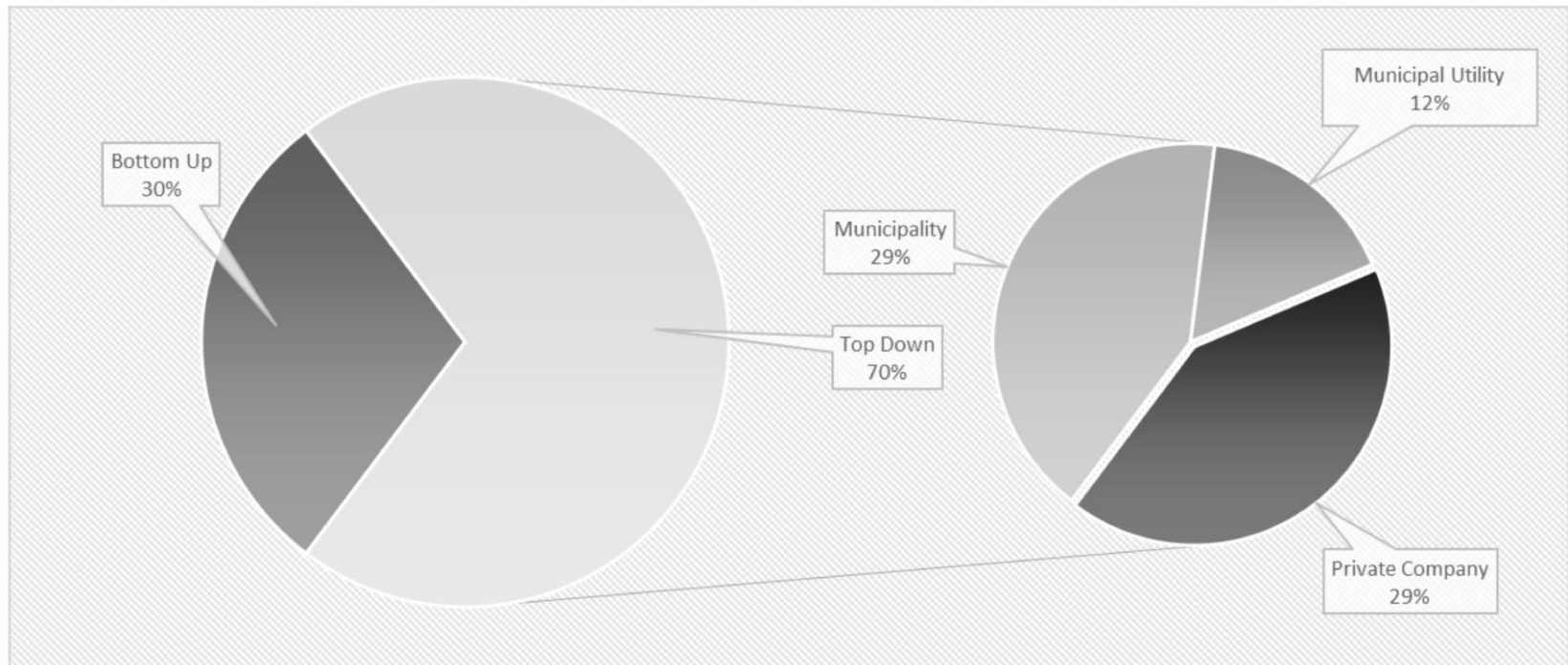


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Dynamics of creation



- 70% Top down initiatives
- Emerge the role of municipalities



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Legal structure and level of participation

Table A1. Dynamics of creation and organizational structure.

Project	Project ID	Proponent	Approach	Legal Form	Instrument for Citizens	Ownership Structure	Citizens Ownership (%)	Citizens Involved	Financing Structure
RETENERGIE	1	Community	Bottom up	coop	Equity/Debt	Citizens	100%	915	70% citizens + 30% debt (bank)
DOSSO ENERGIA	2	Mix** (Community & Association)	Bottom up	Ltd company	Equity	Citizens	100%	64	100% equity (citizens)
SOCIETA' LEDRO ENERGIA SO.L.E.	3	Community	Bottom up	coop	NA	Citizens	NA	260	NA
E'NOSTRA	4	Mix (Associations & Companies)	Bottom up	coop	Equity	Citizens + Proponents	80%	300	80% equity (citizens) - 20% (proponents)
MELPIGNANO	5	Municipality	Top down	coop	NA	Citizens	100%	136	100% debt (bank + legacoop)
KENNEDY ENERGIA	6	Municipality	Top down	Ltd company	Equity	Citizens	100%	50	100% equity (citizens)
SOLE PER TUTTI	7	Municipality	Top down	coop	Equity	Citizens	100%	62	40% equity (citizens) + 60% debt (bank)
COMUNITA' ENERGETICA SAN LAZZARO	8	Municipality	Top down	Association	Equity*	Municipality*	100%*	74	100% equity (citizens)
COMUNITA' SOLARE LOCALE	9	Municipality	Top down	Associations	Equity**	Citizens + local ESCO**	0,5%	25	NA
UN ETTARO DI CIELO	10	Municipal Utility	Top down	Ltd company	Bond	Municipal Utility	0%	300	Initially financed by company then opened to citizens. 50% equity (Mun. Utility) + 50% debt (citizens)
IMPIANTO EOLICO MONTE MESA	11	Municipal Utility	Top down	Ltd company	Bond	Municipal Utility	0%	NA	NA
ENERGYLAND	12	Company	Top down	coop	Equity	Citizens + Company	~ 30%	123	Initially financed through private company capital, then opened to citizens
MASSERIA DEL SOLE	13	Company	Top down	coop	Equity	Citizens + Company	~ 90%	187	Initially financed through debt (bank), then equity opened to citizens
FATTORIA DEL SOLE	14	Company	Top down	coop	Equity	Citizens + Company	NA	152	Initially financed through debt (bank), then equity opened to citizens
FATTORIE DEL SALENTO 1	15	Company	Top down	coop	Equity	Citizens + Company	Still Open	175	Initially financed through debt (bank), then equity opened to citizens
FATTORIE DEL SALENTO 2	16	Company	Top down	coop	Equity	Citizens + Company	Still Open	175	Initially financed through debt (bank), then equity opened to citizens
ENERGIA POSITIVA	17	Citizens	Bottom up	coop	Equity	Citizens	100%	304	100% equity (citizens)

* Municipality formally owner of the PV system, but investment financed by citizens association, who manages the project and gets returns out of it. ** Initiative proposed by municipality, PV systems developed by local ESCO which then open ownership to citizens

- Legal structures: ~ 60% coop; the remaining 40% company, association
- Level of citizens ownership (and co-determination) not necessarily correlated to coop legal structure -> dynamics of creation more relevant
- Strong top down approach or company proponent -> lower citizens ownership and lower co-determination in organizational structures



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Type or activity

Table A2. Type of activity and timing.

Project	Project ID	Start Date	Primary Activity	Technology	Plant Size (kWp)	Investment Cost (euro)**	Scope
RETENERGIE	1	2008	Mix (Electr production & energy services)	PV	879 kWp (spread over 12 projects)	2.2 Mn (collected from citizens Investments. Cumulated, 2016)	National
DOSSO ENERGIA	2	2010	Electr. Production	PV	74,56 + 29,36 + 5,04 kWp	369 k	Local
SOCIETA' LEDRO	3	2007	Mix (Electr production & energy services)	PV	40 kWp + 59 kWp	NA	Local
ENERGIA SO.L.E. E'NOSTRA	4	2014	Elect. Supply	-	-	NA	National
MELPIGNANO	5	2011	Mix (Electr production & energy services)	PV	180 kWp (33 plants, 4 of them sold to some members, 29 still under the coop ownership)	400 k	Local
KENNEDY ENERGIA	6	2013	Electr. Production	PV	100 kWp	170 k	Local
SOLE PER TUTTI	7	2011	Electr. Production	PV	102 kWp	450 k	Local
COMUNITA' ENERGETICA SAN LAZZARO	8	2011	Electr. Production	PV	20kWp	49 k	Local
COMUNITA' SOLARE LOCALE	9	2011	Mix (Electr production & energy services)	PV	1378kWp (56 plants)	3 M	Local
UN ETTARO DI CIELO	10	2008	Electr. Production	PV	1000 kWp	5 M	Local
IMPIANTO EOLICO MONTE MESA	11	2014	Electr. Production	Wind	8 MW (4 windtowers)	NA	Local
ENERGYLAND	12	2011	Electr. Production	PV	1000 kWp	3.6 M (about 1M allocated to citizens)	Local
MASSERIA DEL SOLE	13	2013	Electr. Production	PV	999 kWp	1 M	National
FATTORIA DEL SOLE	14	2015	Electr. Production	PV	998.4 kWp	1 M	National
FATTORIE DEL SALENTO 1	15	2017	Electr. Production	PV	999,605	NA	National
FATTORIE DEL SALENTO 2	16	2017	Electr. Production	PV	997,92	NA	NationL
ENERGIA POSITIVA	17	2016	Electr. Production	PV, EO, Idro, energy saving	1571.18 kWp (over 12 plants)*	3.3 Mn (Splitted in quotas of 500 € each. Cumulated value, 2019)	National

* Includes cost of roof insulation. **Investment costs are indicated only for initiatives focus on the development of a single electricity production plant. *** Acquisition and refinancing of an already operating ground mounted PV plant

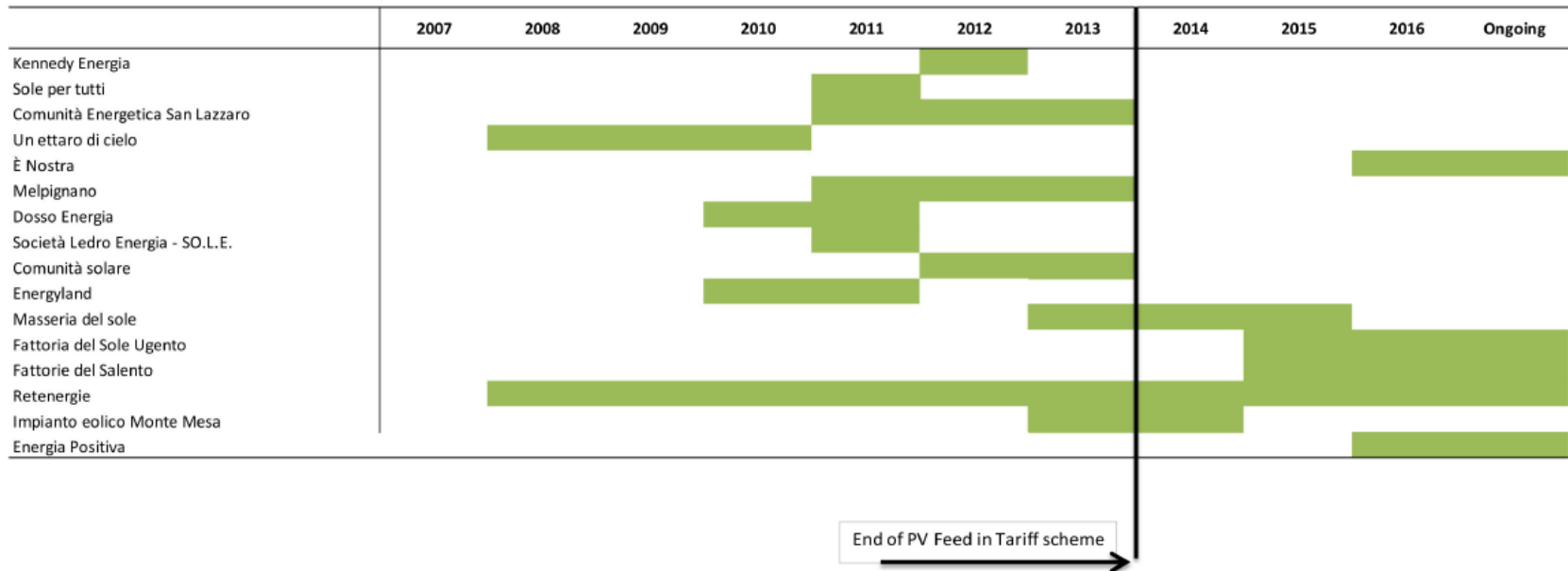


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- Electricity Production as main activity (16 out of 17)
- Focus on photovoltaics (PV)
- Mostly small and local initiatives (~20-100kw)

Timing and the role of policy



- Strongly dependent on FiT support to PV (up to 2013)
- After 2013 the only electricity production initiatives still ongoing are the larger/national scope still operating (For Green's initiatives – Retenergie)
- Similar trend in other countries, e.g. Germany



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(see also: Wierling A, Schwanitz VJ, Zeiß JP, Bout C, Candelise C, Gilcrease W, Gregg JSc, 2018, [Statistical Evidence on the Role of Energy Cooperatives for the Energy Transition in European Countries](#), *Sustainability*, ISSN: 1937-0709)

Outcomes for citizens and typologies

Table A3. Outcomes.

Project	Project ID	Primary Activity	Return on Investment (%)	Other Monetary Benefits (Citizens/Municipality)	Other Energy Social Services
RETENERGIE	1	Mix (Electr production & energy services)	1.5-3	Monetary benefits (in various forms) for citizens providing assets (e.g. schools providing rooftops)	Collective electricity purchasing scheme for: domestic Pv systems, domestic storage, EV and other services (insurance, internet, bank services, editorial). Collective scheme for domestic energy efficiency audit
DOSSO ENERGIA	2	Electr. Production	~6	Municipality get annual rent for school rooftop use	Wider social engagement promoted by pre-existing green association
SOCIETA' LEDRO	3	Mix (Electr production & energy services)	NA	NA	Promoted: local collective electricity purchasing scheme; local electrical bike sharing scheme
ENERGIA SO.L.E. E'NOSTRA	4	Elect. Supply	2	None	Working on pilot distribution of smart meters to cooperative members
MELPIGNANO	5	Mix (Electr production & energy services)	Not applicable	None	Electricity bill savings for end users providing assets (citizens). Scheme for water distribution and reduction of plastic bottles use
KENNEDY ENERGIA	6	Electr. Production	~6	Municipality gets value of electricity bill savings	Education activities in schools promoted by people involved in Kennedy energia
SOLE PER TUTTI	7	Electr. Production	~3	None	School providing roof space also gets roof insulation. Some of the electricity bill savings invested in the school activities
COMUNITA' ENERGETICA SAN LAZZARO	8	Electr. Production	NA	Municipality gets value of electricity bill savings	Promotion of energy efficiency schemes on local public buildings
COMUNITA' SOLARE	9	Mix (Electr production & energy services)	~3,5**	Annual electricity bill discount of 50 € for 20years for citizens	Scheme for domestic energy efficiency audit. Collective purchase scheme for: electric bike, EV, energy efficient appliances
UN ETTARO DI CIELO	10	Electr. Production	5,5(7 years bond);6,5(12 years bond)	None	Offered to citizens 25 allotment gardens on the PV gournnd mounted plant field
IMPIANTO EOLICO MONTE MESA	11	Electr. Production	6,5 (7 years bond)	Royalties to municipality (~100k€/year)	Education activities (guided tours for schools)
ENERGYLAND	12	Electr. Production	6.5-8.8*	Electricity bill savings for citizens (proportional to quota)	None
MASSERIA DEL SOLE	13	Electr. Production	~8	Electricity bill savings for citizens (proportional to quota)	None
FATTORIA DEL SOLE	14	Electr. Production	NA	Electricity bill savings for citizens (proportional to quota)	None
FATTORIE DEL SALENTO 1	15	Electr. Production	NA	Electricity bill savings for citizens (proportional to quota)	None
FATTORIE DEL SALENTO 2	16	Electr. Production	NA	Electricity bill savings for citizens (proportional to quota)	None
ENERGIA POSITIVA	17	Electr. Production	~9	Electricity bill savings for citizens (proportional to quota)	None

* including value of electricity bill savings for 1,000 kWh per year, per quota. ** including value of electricity bill savings for 50 € per year for 20 years

1. Electricity production initiatives:

- ✓ primary activity development of a single renewable plant.
- ✓ Main objective: distribution of ownership and returns among citizens/members (~10)
- ✓ Higher returns offered (~5-8%)

2. Others:

- ✓ Develop multiple projects and offer other energy services to citizens/members
- ✓ Objective: provide wider environmental and social benefits to community (~4)
- ✓ Lower returns offered (~1,5-3%)



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Concluding

- Community energy sector in Italy still small, mostly characterized by ad hoc and local initiatives
- **Negligible impact** on renewable production in Italy
 - They have installed about 0.07% of total PV installed capacity in Italy
 - (Wierlinga, A., Zeissa, J.P., Lupi, V., Candelise, C., Sciallo, A., Schwanitz, V.J. "The contribution of energy communities to the up-scaling of photovoltaics in Germany and Italy", forthcoming)
- Strongly **dependent on renewables (PV) incentives** (Feed in tariffs)
- Since discontinuity of FiT support only **three, larger initiatives** with national scope (both in activities and members) have continued activities
- Looking forward?



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Policy evolution

- Summary of recent legislative and regulation developments having an impact on the Italian energy community sector.

November 2017	National	The Italian Energy Strategy is the first national document explicitly mentioning energy communities
August 2018	Regional	A new regional law promoting energy communities was approved in Piedmont
December 2018	National	The National Energy and Climate Plan wants to promote self-consumption (prosumer) and energy communities but it is not clear how (the only explicit measure highlighted is the simplification of authorization procedures)
December 2018	EU	Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources introduces and promotes renewable energy communities
June 2019	EU	Directive (EU) 2019/944 on common rules for the internal market for electricity introduces and promotes citizen energy communities
July 2019	National	New decree that re-introduces subsidies for renewable electricity (except PV)
January 2020	National	Energy communities pilot projects will be developed following a consultation paper promoted by the Energy Authority and two call for proposal by RSE (Ricerca sul Sistema Energetico, a public company devoted to research on the energy system)
February 2020	National	A provision of Law 8/2020 allows small-scale collective self-consumption of renewable energy plants below 200 kW for customers linked to the same low voltage distribution sub-grid



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EC firstly defined as legal entity

Directive (EU) 2018/2001: 'Renewable Energy Community' means a legal entity:

- (a) which, in accordance with the applicable national law, is based on open and voluntary participation, is autonomous, and is **effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects** that are owned and developed by that legal entity;
- (b) the shareholders or members of which are natural persons, SMEs or local authorities, including municipalities;
- (c) the **primary purpose of which is to provide environmental, economic or social community benefits for its shareholders or members or for the local areas where it operates, rather than financial profits**;

Directive (EU) 2019/944: 'Citizen Energy Community' means a legal entity that:

- (a) is based on voluntary and open participation and is **effectively controlled by members or shareholders** that are natural persons, local authorities, including municipalities, or small enterprises;
- (b) has **for its primary purpose to provide environmental, economic or social community benefits to its members or shareholders or to the local areas where it operates rather than to generate financial profits**; and
- (c) may engage in generation, including from **renewable sources, distribution, supply, consumption, aggregation, energy storage, energy efficiency services or charging services for electric vehicles or provide other energy services** to its members or shareholders;



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Energy communities and self-consumption

- EU Directive 2018/2001 also defines the framework for the implementation of place-based renewable energy communities, with the objective of **fostering local self-consumption and collective self-consumption**
- The objective is to reduce the distance between production and consumption (with positive impacts on grid management), allowing renewable energy production to be consumed locally
- As an initial step toward the national implementation of the EU Directive, a provision has been included in the **recent Italian Law 8/2020 to allow small-scale, collective self-consumption of renewable energy plants of size below 200 kW, for customers linked to the same low voltage distribution sub-grid.**
- A typical case is the block of flats, where the electricity produced by a collective PV plant can now be directly supplied to the customers living in the flats.



Policy re – evolution (?)

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