

Deliverable D6.3

Report on viable funding schemes

<i>Work Package:</i>	<i>WP6 – SOCIAL AND ECONOMIC ANALYSIS</i>
<i>Task/s:</i>	<i>3</i>
<i>Responsible Partner:</i>	<i>IRCrES-CNR</i>

Document history

Version	Date	Authors	Reviewers
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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691875

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1. Introduction and main conclusions

This report presents an exploration of the evolving framework for financing renewable energy projects, including biogas, with a specific focus to innovative forms of private funding and crowdfunding. The main objective is to highlight the insufficiency of conventional funding and incentive schemes for bioenergy projects without an involvement of people and the community even on the financial side of the project.

At the European level, the financing needs to support the transition to a 'low carbon economy' are huge and there is a large untapped potential for involving the private sector in providing financial resources to green energy investments (Section 2). A specific development within this process is the increasing role of institutional investors, as represented by pension funds, insurance companies, foundations, and investment-funds managers. These investors are more and more willing to include socially and environmental sustainable assets in their portfolio, and are increasingly committed to adopt sustainability criteria for the selection of their investments. The development of other instruments, like green bonds, which can be tailored even for not-too-big projects, can further boost the role of private investors in entering green energy investments.

Although public support schemes, based on feed-in tariffs, tax rebates and other conventional forms of public incentives, have helped the financial viability of renewable energy and biogas investments, the situation in major European countries is one of insufficiency of these conventional schemes (Section 3). The reason is that they do not overcome completely the financial barriers still existing for biogas plants and in particular do not overcome the too high dependency on bank lending for the high initial investment. This limitation is particularly critical in front of the uncertainty on climate-energy policy implementation, which can bring to a possibly unstable degree of public support during time. This uncertainty, combined with the great role of bank lending, risks to displace the plant investor during the life of the investment. Therefore, the financial barrier can be variable and uncertain during time, largely depending on the specific institutional and financial environment in which the biogas investment takes place.

Different and more innovative financing approaches are needed to give stability to the investment and possibly give a more extended social dimension to biogas investments. Among these approaches, a very interesting and promising one can be crowdfunding (Section 4, 5, 6). The market for crowdfunding is skyrocketing in different areas and countries, and it is also emerging for renewable energy projects. The suitability of crowdfunding for these projects, including biogas plants, depends on the fact that renewable energy have mixed features of private and public good and it can therefore encounter the willingness of people to pay for the public good component of the investment. In addition, the flexibility of crowdfunding approaches (donation oriented, investment oriented, mixed) can provide people with different options on the very nature of their involvement in the project. The use of crowdfunding is still underdeveloped in the area of renewable energy investments. The majority of crowdfunding schemes for renewable energy are based on

lending (instead of donation and equity or hybrid schemes) and some of these schemes are the evolution of previous community-shared investments. The majority of schemes are in the wind and solar sector. However, various platforms are already in place, also in Italy, and there is a fertile ground for future developments.

A fundamental feature of crowdfunding is that it is not just about money. It is instead about people involvement and can be a channel for benefit sharing with the community. Crowdfunding can be seen as part of a deliberatory democracy process when the local community is involved in financing the project and then it can facilitate participatory processes, also contributing to overcome community's opposition to new investments. Experiences include very different typologies, and the definition of possible crowdfunding schemes within the ISAAC project is to be designed in way tailored to the specific experiences, locations, and actors that will be addressed.

2. The international framework of green finance

2.1 Green investment needs in Europe

The global economy has abundant stocks of financial assets, but insufficient flows of investment in the areas where they are needed for long-term sustainable development.

At the EU level, the Commission’s Impact Assessment of the 2030 Climate and Energy Framework estimates investment needs at EUR 193 billion per year for the period 2011-2030 (excluding transport). This estimate refers to investments needed to modernise ageing infrastructure and avoid lock-in of inefficient technologies that would hamper reaching the Union’s 2030 climate and energy targets. As evident from the figure below, there is a large gap between the amount of climate investment needed and current investment levels not only at European, but also and especially at global level.

Figure 1. Global and European climate finance levels versus future investment needs (€ trillion)



Source: European Commission DG Clima, “Shifting Private Finance towards Climate-Friendly Investments”, Final Report (2015)

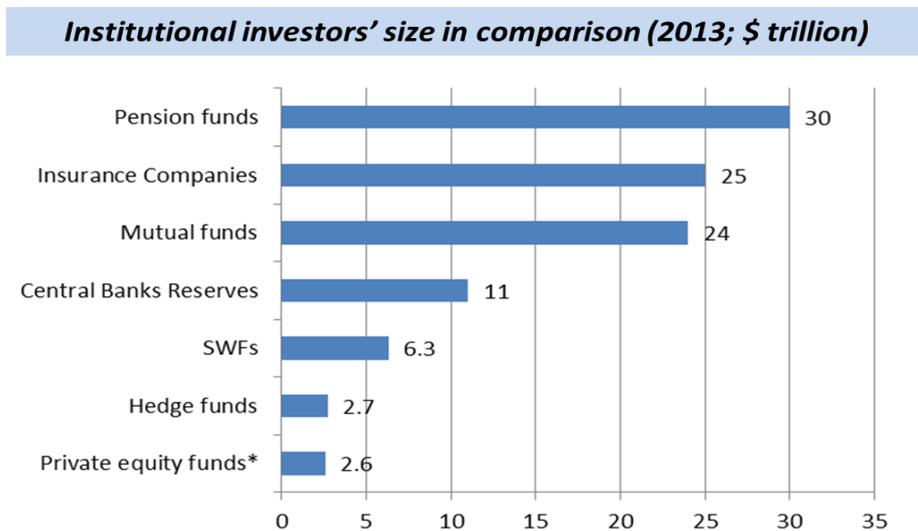
In the EU alone, the annual climate investment needs to 2020 are estimated to EUR200bn, significantly more than the EUR120bn that was invested in this area in 2011/2012. Globally, the needs are even larger, with annual investment needs of EUR780bn. There is a lot of untapped potential in terms of capital from institutional investors that can contribute to closing these investment gaps.

2.2 The role of institutional investors

With the increasing importance of climate and energy policies, a growing number of investors are actively seeking financial products that support sustainability, without compromising returns, liquidity or pricing.

Institutional investors managed assets of US\$93 trillion in 2013. Among them: pension funds, insurance companies, mutual funds, sovereign wealth funds, private equity, foundations and endowments.

Figure 2: institutional investors' size in comparison (2013; \$ trillion)



* Data for private equity funds refer to 2011

Source: *Elaborations on SWFs Annual Reports*, Sovereign Wealth Fund Institute, *The CityUK*, *Towers Watson*, *Financial Times*

Time horizons are differentiated for the different types of institutional investors. Typically, pension funds and insurance companies are characterized by the longest horizons, mutual funds and private equity have medium to long term horizons, while hedge funds are the shortest sighted of all. This tells us that most institutional investors are characterized by medium to long term horizons. At the same time, an extended time horizon is a critical dimension of a sustainable financial system. A process exacerbated by technological and incentive-driven short-termism characterizes many financial markets. For the Governor of the Bank of

England¹, this is a ‘tragedy of horizons’, whereby new challenges to long-term prosperity, such as climate change, manifest themselves beyond the standard regulatory and market horizons.

The climate-friendly investment potential of institutional investors depends not only on their horizons, but also on their governance structure (in-house management vs external asset managers) and risk characteristics (low vs high). The following table summarize the main features in terms of governance, risk and therefore in terms of green potential for the most relevant institutional investors.

Table 1: institutional investors’ main characteristics

Type of Investor	Governance structure	Risk preferences	Climate-friendly investment potential
Asset owners			
Insurance company	In-house investment management, or through external asset managers	General insurance with shorter term liabilities have a lower risk appetite, Life- and pensions have greater risk appetite	Some insurance companies are active participants in renewable project finance markets
Pension fund	Often external asset managers; some large pension funds employ in-house investment managers	Varying risk appetite, reducing over time as pensions matures	Leading European pension funds are increasingly considering such investment
Foundations and Endowments	Often external asset managers; some large organisation have in-house investment managers	Varies, generally relatively high risk appetite	Mission-oriented organisations have often led the way in considering climate-related issues
Sovereign Wealth Funds	Mainly managed internally, but also some use of external managers	Varying risk appetite	With a long-term horizon they have a capacity to invest in climate-friendly
Investment Managers			
Investment Managers	Direct investment	As specified by mandate	Led by asset owners

Source: European Commission DG Clima, “Shifting Private Finance towards Climate-Friendly Investments”, Final Report (2015).

¹ Financial Times.

Around 15 years ago, environmental, social and corporate governance (ESG) issues found a foothold in financial markets, and institutional investors are increasingly willing to provide capital for climate-friendly investment. Many of them have already dealt with integrating sustainability into their operations, extending a traditional focus on governance to incorporate environmental and social factors.

A significant share of institutional investors has made commitments to climate change and responsible investment and are willing to act on these, provided that they are offered climate investment opportunities that also fit their financial investment criteria and return expectations. The key challenge is then to tap into this existing demand for sustainable investments by providing a supply of investments that are climate-friendly on top of being financially competitive.

The Principles for Responsible Investment (PRI) backed by the UN, for investors committed to the integration process of ESG, has grown from 20 initial members in 2006, to the current 1,260 members representing US\$45 trillion of assets under management. The PRI increasingly features 'mainstream' asset owners and managers, particularly from North America and Europe. A number of initiatives are taking place in the context of the UN climate negotiations process as well with increasing attention related to mobilising investors for climate goals before a global climate agreement will be negotiated at COP21 in Paris. The UN Climate Summit in New York City saw a number of specific investors' commitments, notably the Portfolio Decarbonisation Coalition committing to reduce the carbon footprint of US\$100 billion of institutional investments worldwide, and the Montreal Carbon Pledge, led by the PRI. Three big pension funds announced they would grow their investments in low-carbon assets to more than US\$31 billion by 2020. In addition, two insurance industry associations representing the majority of global insurance companies announced they would double the industry investment in climate investments to US\$84 billion by the end of 2015. Insurance companies have been the most active groups in the financial sector urging governments to take tougher action to combat global warming because they are among the most exposed to the extreme weather that scientists predict is likely to increase as the climate changes.

The 2014 Global Investor Statement on Climate Change has been signed by over 370 investors with more than \$24 trillion in assets. It represents an important contribution by the global investment community to supporting the UN Climate Summit and encouraging strong domestic and international climate and clean energy policies. The Statement sets out steps that institutional investors (both asset owners and asset managers) can take to address climate change, and calls on governments to support a new global agreement on climate change by 2015, in addition to national and regional policy measures. The Statement was drafted through a collaboration of six organizations: the Institutional Investors Group on Climate Change (IIGCC - Europe), the Asia Investor Group on Climate Change (AIGCC), the Ceres Investor Network on Climate Risk (INCR), the Investor Group on Climate Change Australia/New Zealand (IGCC), the United

Nations Environment Programme Finance Initiative (UNEP FI), and the United Nations-supported Principles for Responsible Investment (PRI).

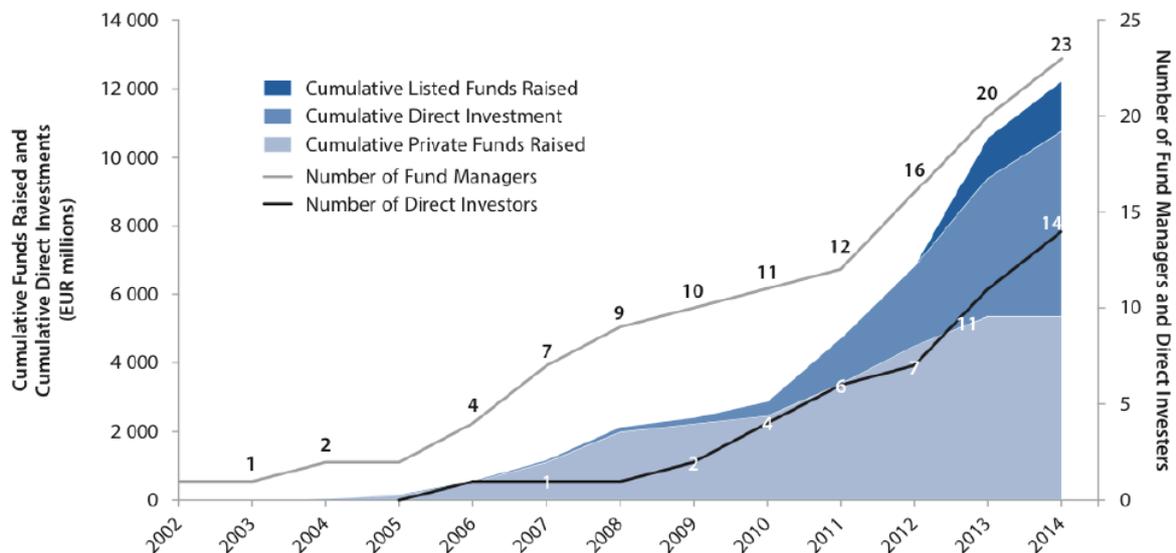
Institutional investors may support green investments through traditional or alternative asset classes, more specifically:

- i) *Equity*: vehicles for green equity investing include indices, mutual funds, and ETFs.
- ii) *Fixed-income*: this group include for example “green bonds” as detailed in the next section.
- iii) *Alternative asset classes*: for example real estate funds, infrastructure funds, private equity vehicles.

A lack of common definitions for climate-friendly assets and a lack of available data makes it difficult to estimate and track climate-friendly assets in a precise and robust way.

A subset of low-carbon investment is renewable energy for which exposure is easier to measure. Institutional investment for renewable energy in Europe has increased markedly the last decade, although from a very low base (Figure 3).

Figure 3: Institutional investors’ financing of renewable energy in Europe (€ million)

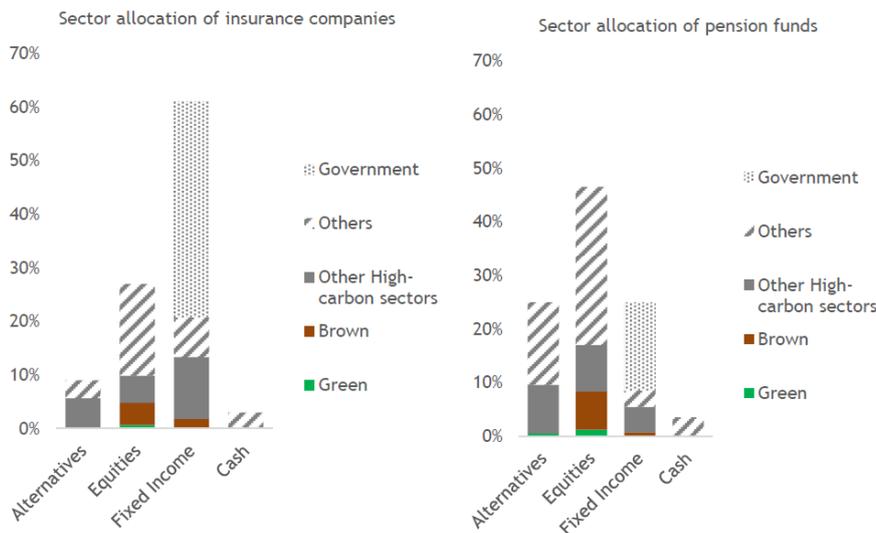


Source: European Commission DG Clima, “Shifting Private Finance towards Climate-Friendly Investments”, Final Report (2015)

However, despite a significant increase in absolute terms, sustainable energy investment intended in a broader sense still accounts for a very small share of institutional investors’ assets under management. According to the European Commission (2015), the share of climate-friendly investment in the portfolios of

pension funds and insurance companies is between 1-2% for green, between 5-10% for brown, and for high-carbon sectors around 20-25%. The rest of the portfolio is classified as “other”. The highest share of climate-friendly investment is in the infrastructure funds of the alternative parts of institutional investors’ portfolios, the lowest share in the bond portfolio. The type of climate-friendly investments also varies by asset class.

Figure 4: The share of climate-friendly investment in institutional investors’ portfolios by asset class



Source: European Commission DG Clima, “Shifting Private Finance towards Climate-Friendly Investments”, Final Report (2015).

In spite of the uncertainty, what we can conclude is that the order of magnitude of climate investment as a share of the overall portfolio is definitely too low if compared to the level of overall climate investment needs. There is a lot of untapped potential in terms of capital. If this happens in spite of the willingness by institutional investors to commit to sustainable investments, it implies that these investors are finding it difficult to identify assets that are climate-friendly and, at the same time, also comply with their financial investment criteria, across all asset classes.

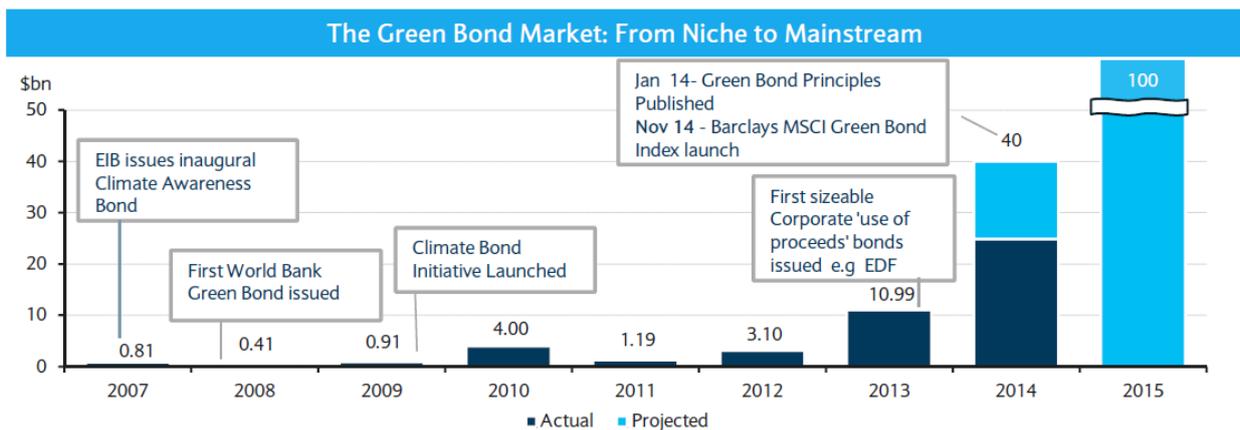
2.3 Green bonds

Green bonds are debt securities issued to raise money for projects that limit the damage humans inflict on the planet. Proceedings of green bonds are therefore earmarked for projects that benefit the environment. Financing global growth in a sustainable and clean way has become a key priority for governments and institutions around the world. Green and low carbon financing instruments have now become one of the fastest growing markets internationally. Green bonds appeal strongly to investors who want a so-called

'double bottom line' from their fixed-income investments: dependable financial returns, on the one hand, and the satisfaction of helping make the world more sustainable.

As an asset class, green bonds have grown exponentially. From 2007-2012, green bond issuance totalled \$8.5 billion. This volume more than doubled in 2013, reaching around \$20 billion by the end of 2013. 2014 marked a quantum leap with an issuance which surpassed \$40 billion. However, the total was still tiny in comparison with the overall size of bond markets.

Figure 5: Green bond market evolution



Source: Climate Bond Initiative, MSCI ESG Research, Barclays research

Who are the issuers in this market? Early pioneers were international organisations such as the European Investment Bank (it was the first in 2007, although its €600m environmental issue was dubbed a “climate awareness” rather than “green” bond) and the World Bank. However, corporate issuers recently joined the group. Private issuers are embracing the green bond market as a means of promoting their brand images and product lines, besides boosting efficiency and diversifying their investor bases. Companies such as EDF, GDF, Unilever, Iberdrola and Toyota are leading in this market. In 2014 the biggest deal was a \$3.4bn green bond from GDF Suez, the French utility. Recent issues have also included “green” asset -backed securities — or loan packages — from Toyota. Bank of America issued its first corporate green bond in November 2013 to finance renewable energy projects such as wind, solar, geothermal and energy efficiency projects. In May 2015, the same bank issued its second green bond for \$600 million in aggregate principal

amount to fund renewable energy and energy efficiency projects² under the company's \$70 billion multi-year environmental business commitment. The list of possible issuers includes a wide spectrum of entities including municipalities looking to fund environmentally-friendly projects.

At the same time, interest from investors is growing. The investor base is increasingly diversified, including not only dedicated "green" investors, but also other broad-based investors who consider these new bonds part of their expanding investment choice set. Asset managers are on the front lines. For example, BlackRock was awarded a \$1 billion mandate from Zurich Insurance in November 2013 and a further \$1 billion in July 2014. Barclays said in September 2014 that it would invest more than £1bn into investment grade green bonds by November 2015, while Swiss insurer Zurich Insurance has pledged to invest up to \$2bn. HSBC announced this November its pledge to commit \$1 billion to a green bond portfolio which will invest in high quality liquid assets in the form of green, social or sustainability bonds. These bonds will be aligned with the Green Bond Principles and will be used to fund projects in sectors such as renewable energy, energy efficiency, clean transportation and climate change adaptation as well as SME financing in sectors such as public transport, education and healthcare. Insurance and pension institutions are also formally committing to sustainability-related objectives for their portfolios and green bonds represent the perfect tool to substantiate these commitments.

² Examples of financed energy efficiency projects: City of Los Angeles Streetlights Project, Antioch Unified School District, City of Oakland Streetlights Project. Examples of financed renewable energy projects: Solar City, Solar PV Power Partnership; Silicon Ranch, Simon Solar; Atlantic Power, Canadian Hills; NextEra, Pioneer Plains; NextEra, Steele Flats; Invenergy, Prairie Breeze.

3. Funding RES and biogas investments

3.1 Barriers to RES project funding

In front of the next revision of the Renewable Energy Directive (2009/28/EC), renewable energy produced from biomass play an even more pivotal role in the decarbonisation of Europe's energy mix with respect to the past (European Biogas Association, 2016). Although electricity and heat from biomass represents a main issue in the greening of the energy sector, its production is characterized by higher costs compared to conventional fossil fuel-based production. Beside technical barriers, the provision of energy produced from biomass is challenged by non-technical barriers that could hinder the diffusion of these technologies.

Rosch and Kaltschmitt (1999) state that the main challenges to be overcome in order to build a favorable environment for biomass energy projects concerns: (i) funding, financing and insuring; (ii) administrative conditions; (iii) organizational hurdles; (iv) lack of knowledge and information; and (v) public acceptance. These challenges often increase the likelihood of project planning/making failure since they may negatively impact overall costs and financing. In addition, biomass-based energy production suffers a gap in competitiveness with respect to electricity production from fossil fuels due to market failures. The presence of negative environmental externalities recalls for public funding and environmental policies aimed at increasing the economic value of biomass energy plants which provide environmental advantages compared to existing, incumbent fossil fuel-based technologies.

Market failures and low competitiveness associated to electricity and heat from biomass affect the economic viability of bioenergy plants. Furthermore, market risks threaten project realization through uncertainties in the demand for energy in the mid and long term in Europe (mainly driven by changes in the national and European energy markets); uncertainties related to the future price of biomass; and persistency of national and environmental policy aimed at guaranteeing reimbursement and compensation for the production of energy from biomass and other renewable energy technologies (Rosch and Kaltschmitt, 1999).

Several EU Member States have implemented programs to provide financial support to electricity and heat produced from biomass. Biogas plants, for example, require a high initial investment which should be supported by sound financing tools. The main costs are related to: planning (engineering costs, permits, taxes, etc.); equipment (buildings, storage facilities, etc.); feedstock; operation and maintenance costs (personnel, etc.); and financing (interest, fees) (Hahn et al., 2010). Typical investors are single farmers, several farmers jointly investing in a single facility, industry or partnership between private investors and waste companies/municipalities (Hahn et al., 2010). The expected profitability of the plants depends on the above-mentioned market risks and uncertainties which influence the likelihood of achieving financial support. Indeed, the expected financial performance strongly depends on national supporting schemes. To stimulate

the diffusion of this energy source, governments have the possibility to implement different policy instruments which may reduce market risks and uncertainties in order to increase economic viability of the biomass plants.

Investment subsidies in the form of allocated grants, soft loans and tax credit based on kW of capacity installed (Haas et al., 2011), are pivotal instruments to incentivize biomass plants. Depending on the country, high initial capital costs may be faced through low-credit interests and project funding from public sources. For example, at the beginning of the nineties Italy and Germany implemented investment subsidies in order to promote the diffusion of renewable energy projects. In Italy, investment subsidies in 1991 offered up to 30-40% of the capital cost of the plant, whereas in Germany, the Market Incentive Programme allocated, over the period 1995-1997, almost 10 million euro for renewable energy plants before 2000 (Thornley and Cooper, 2008). However, Rosch and Kaltschmitt (1999) highlight that changing funding conditions within the duration of the funding and long approval procedures may hinder the effectiveness of these policies. The most recent framework of incentives for biogas and biomethane in Italy is described in Maggioni (2014).

Another obstacle to biomass plant is the access to private funding. Market failures and uncertainties lower the economic efficiency of biomass energy production, decreasing the confidence of private subjects on the project. In Italy there are two main sources which provide financing and leasing of biomass projects: private companies and banks/credit institutes (Hahn et al., 2010). As the latter represents the most common financing method (through both traditional and project financing), there are different mechanisms to incentivize private investment in biomass projects. Government intervention can increase the economic value of biomass and address market failure in the energy market through feed-in tariffs which guarantees a premium price for a fixed period to renewable energy producers that can be dependent or independent from electricity market fluctuations (Couture and Gagnon, 2010).

In addition, stability in the remuneration scheme is another essential feature of feed-in tariffs to maintain investor confidence (Held et al., 2007). As far as biogas is concerned, although feed-in tariffs foster the realization of plants through an increase in their expected profitability, their introduction may generate complex dynamics in other sectors of the economy. Whereas feed-in tariffs reduce the gap in competitiveness between electricity produced from fossil fuels and biomass, they may impact the maize silage market, fostering demand and rising price. This impacts are even more prominent in geographical areas characterized by a high density of biogas plants in which competition between biogas sector and agri-food supply chain is already high (Bartoli et al., 2016).

Another instrument to incentivize production from biomass is government investment credits with particularly low interest rates; tax allowances for investments in biomass energy production; and tax incentives.

Furthermore, there are other financing instruments than credits from private banks such as venture capital funds, risk share holdings, and voluntary green pricing by customers (Rosch and Kaltschmitt, 1999).

3.2 Financing tools for biogas

The aim of this section is to survey the private investment tools for financing biogas plants across Europe. The information is mainly provided by the reports of the 2010 BIOGASIN project³ on the most developed European biogas markets.

Financing tools in Germany

German investors have various opportunities to receive financial assistance for biogas projects, ranging from specialized private consulting and technology companies to banks and credit institutes. The latter is the most common form of financing and usually an equity capital of 20-30% is required to receive the funding. The cash-flow based project financing is so spread, also because of the good and predictable framework conditions of the German Renewable Energy Sources Act (EEG).

German banks have dedicated experts and are therefore well prepared in this matter. Examples of active banks in biogas financing are Umweltbank AG, DZ Bank, DKB Deutsche Kreditbank, and Hypovereinsbank. Usually, a questionnaire is provided to the potential investors to assess the project framework and to begin the negotiation between the credit institution and the investors.

In Germany, the size of the biogas project and the feedstock type influence the capital costs which usually ranges from 2 500 to 6 000 €/kW. The average size of biogas plants in Germany is about 400 – 500 kW. Thus, capital costs are usually too high for financing with equity capital only, and thus financing usually includes a large percentage of debt capital.

Financing tools in Austria

Similar to the German case, there are several financing opportunities for biogas projects in Austria, such as specialized private consulting and technology companies and leasing for renewable energy projects supported by specialized staff of banks and credit institutes. The requested equity for a good performance is 20-30% of the capital cost.

For credit approvals and profitability computation, the investor needs to submit all permissions and a valid supply contract Austrian Settlement Centre for Green Electricity (OeMAG). The financing costs are

³ <http://www.biogasin.org/>

calculated using the WACC-approach (Weighted Average Cost of Capital). If the investor decides to take advantage of biogas subsidies, the equity is reduced, therefore influencing the amount of the financing.

Typical investors are single farmers, groups of farmers, municipalities, energy utilities, waste companies and the industry. The average size of biogas plants in Austria is about 250 kW.

Financing tools in the Netherlands

Rabobank Groep N.V. is a Dutch financial service provider that supports around the 75% of the installed biogas plants. Besides, investors can receive assistance also from other credits institutes and private consulting companies. The lifespan of a loan depends on the guaranteed period of subsidies.

The success of Rabobank is partly due to the Green Funds scheme, a Dutch tax incentive scheme which is only available for capital intensive investments such as large scale biogas plants. Green financing enables investors to finance green projects less expensively, by offering a lower interest rate (1-2% lower) for environmentally friendly investments.

Another potential source of funding is the Dutch Greentech Fund, an Amsterdam based company, which has the aim to invest in technology start-ups developing innovative technologies or processes that make the chain from raw material to product more sustainable. The company is also concerned with bioenergy and recently invested 2.5 million euro in a biogas plant in the form of a minority stake.

Finally, it is a common financing method in the Netherlands to finance biogas plants with credits from private banks including both traditional and project financing without any special conditions for biogas projects.

Investors in biogas plants are usually single farmers, consortia of farmers, municipalities, energy utilities, waste companies and the industry.

Financing tools in Denmark

Denmark has a long tradition in biogas plants, which started back in the 1970s with a few farmers which created small plants in order to face the difficulties posed by the oil crisis. During the 1980s, the construction of centralized co-digestion biogas plants owned by consortia of farmers started to flourish.

At present, Denmark represents a peculiar case since consumer-owned and municipality-owned CHP (Combined Heat and Power) plants deliver a significant share of the national power production; moreover, community's inhabitants own the most of these plants. Therefore, given the direct benefit for the various municipalities, this system is supported through attractive governmental investment grants and loans with

very low interest rates. Usually, centralized biogas plants are financed in connection with a district heating system where the waste heat of the CHP plant is used to supply private households (in Denmark 60% of households are connected to a district heating system).

The financing of biogas plants is not direct but it is connected to the feasibility and the stability of the district heating system, which is guaranteed by many factors: first, a stable energy policy; second, municipalities are usually guarantor for the loans. Finally, consumer must remain connected to the grid and the payment of at least a fixed tariff is compulsory. Thus, many companies and banks at the national and international level are willing to invest in the Danish system.

There exist other forms of direct funding for biogas project, such as index-regulated annuity loans⁴. These are guaranteed by the municipalities and present a low interest rate with indexation, which secure the investor against inflation. The payback period is normally more than 20 years.

Single farmers can finance their biogas plants through credits from private banks, even though credit price is high and credits for financing biogas projects do not offer any special conditions. Notwithstanding that, most biogas plants established in last decade are farm scale plants.

For large scale biogas plants typical investors are consortia of farmers, usually cooperating with private limited liability companies. Other typical investors are independent foundations or consumer organization. Municipality-owned biogas plants were established in the past but are actually not common.

⁴ An annuity loan is a type of loan an annuity holder borrows money against the cash value of the annuity contract. Source: <http://www.finweb.com/loans/what-is-an-annuity-loan.html#ixzz4Y6n5zC8x>

4. Crowdfunding: general developments

4.1 The development of crowdfunding

Society may be willing to pay incremental resources for more secure and cleaner energy. Given the likely presence of (local) winners and losers, policy makers might need to compensate part of society in monetary terms. What is relevant in social terms is the larger amount of winners with respect to losers, in economic magnitude terms. Notwithstanding the low political appeal of taxes, new environmental taxes (on resources, pollution) can create revenues to be earmarked to specific aims. Those revenues can support the development of cleaner energy in a given territory; provide incentives and premiums for cleaner and more efficient projects, funding compensations to the part of society that is negatively affected.

Instead of using taxes, local projects can be supported by bottom up schemes that rely on people's donations to 'Trusts' or 'Funds'⁵. Trusts are non-profit/private mixed financial mechanisms that support the start-up of project that deliver market and non-market benefits, like cheaper energy, employment creation, more energy security, and CO2 reduction.

Within this 'voluntary donation' funding system wherein society cooperates to support a given project, the crowdfunding (CF) investment framework is very interesting in the energy sector⁶.

Crowdfunding schemes turnover has skyrocketed over the past decade. The USA and UK present as expected larger shares due to historical stronger developments of green financial markets. The CF renewable energy market is still in a sort of infancy, but witness coherent very high growth and success rates. Success nevertheless depends on factors that are not often easily replicable case by case. The degree of idiosyncratic local features that exert influence is very high. Those features are the 'local' aspects that give importance to the 'involvement' nature of CF projects if set and organized not only as monetary processes.

Crowdfunding is a rather new method to fund projects by individuals using the social web. After its successful implementation in the field of non-profit cultural and social projects in recent years it is now innovating the domain of start-up financing. In terms of rewards in the cultural and social sector, some platforms just thank their donors but most crowdfunding platforms give in kind rewards to contributors in the form of e.g. CDs, t-shirts, and access to artists. Being part of a community and a communication process with the project initiators is often an important impetus for crowdfunders to support a project. Only in the field

⁵ Those funding schemes are analyzed in a qualitative way in the survey of ISAAC, which in the first round tries to investigate social preferences. The two consequential Future surveys might include monetary evaluations.

⁶ Generally speaking, crowdfunding has increase worldwide from 0.53 billion/\$ in 2010 to 16.20 billion/\$. The EU turnover is over 3 billion/\$ (the USA almost 10 billion/\$).

of commercial start-up financing crowdfunding are considered as investors and therefore expecting financial return. Nevertheless there is a growing number of crowdfunding platforms in the creative sector especially in the field of music production where donors are promised financial rewards. Social media play an important role for the development of crowdfunding. Facebook, Twitter and blogs are important tools to communicate information about crowdfunding projects to potential contributors and possibly convert social capital into financial capital. The interactive web empowers users to create content and to distribute and discuss it. The social web enables bypassing the intermediaries of a traditional supply chain. This 'disintermediation' can be observed as well in the area of crowdfunding. Money seekers can now bypass banks, venture capitalists, business angels or public financing regimes thus making funding processes more transparent and democratic. These traditional mediators see the rise of crowdfunding as competition or even a threat for their business models. There is however, a potential benefit for the traditional mediators as well - they can use crowdfunding to find innovative ideas and use the "wisdom of the crowd" to estimate the success of a start-up or a project in the creative industries. The nature of the social web is quite informal. Crowdfunding is successful because it transfers models of informal co-operation to the world of financing and leads to democratisation and transparency in financing. Crowdfunding is an interesting example of how social capital can be transferred into real cash. More money seekers can start a venture and more people can support projects or even become investors with a small amount of money and with little risk.

The term crowdfunding means the process by which more people ("mob" or crowd) give sums of money (funding), even modest, to finance a business project or different types of initiatives using Internet sites ("platforms" or "portals ") and sometimes in exchange for receiving a reward.

Crowdfunding is a suitable financing technique for investment projects which do not need high amount of resources or for which other forms of participation in their implementation and to business risk, such as venture capital activities or the use of closed-end funds, are not practically workable.

Usually, in these cases, lacking other grants, the only financing channel is represented by the availability of promoters, in the absence or in addition to which it is possible to recur to the community through Internet platforms. In some cases, the crowdfunding is applicable even in projects with high capital intensity, as in the civic crowdfunding, through which the contribution of citizens, reached through the network, will co-finance and implement public works or social interest.

The concept behind crowdfunding is very similar to that of microfinance, for which small amounts of money can contribute to economic development of a firm, providing the access to financial resources to subjects or projects usually excluded from major financial channels. The "democratic" connotation of crowdfunding consists in trying to offer an opportunity to launch a product or in an entrepreneurial initiative because of social proof of the express market through the network.

The good thing about crowdfunding is the active participation of community to the project implementation, which is approved and supported financially and which is shared in the purposes and risks. It's clear that, from this point of view, the emotional involvement is important and represent the foundation of this kind of financing.

4.2 The models

It's possible recognize different crowdfunding models according to the type of relationship that develops between the financier and the founded and the kind of reward , if anything, investors receive for their contributions:

- The donation-based crowdfunding
- The lending-based crowdfunding or peer to peer lending
- The reward-based crowdfunding
- The equity-based crowdfunding

The donation-based⁷

Donation-based crowdfunding plays a crucial role in the new wave of alternative finance and consists of collecting money via internet delivered for liberal reasons, so without any financial return.

This form of crowdfunding essentially involves backers donating varying sums of money to support a specific cause or project. Sometimes they will receive a simple "thank you" or a special mention – or even a physical item such as a postcard – however, the pledge is essentially a donation.

Initiatives mainly refer to the third sector, no profit organizations, entities and associations with a social purpose, requiring funds to the crowd in order contribute to an ethics or social cause. The donor in this case is driven substantially by a philanthropic, collaborative and charitable motive.

The donation platforms represent one of the most popular models, and in 2012, its market totalled about 979 million dollars. The funds required for each project are on average rather low: about two-thirds of operations

⁷ <http://www.crowdfundinsider.com/the-ultimate-crowdfunding-guide/>

generate less than \$ 5,000 each, and at \$ 1.400 on average; often, when the goal is charity, there are no minimum investment restrictions to be reached,

That is why the total amount donated will be allocated for the project. Among the objectives, the social causes are those that characterize the donation-based crowdfunding, although there are projects in the field of art, cinematography and music.

Examples of these platforms, focused on social projects, are:

- <http://www.betterplace.org/de/>
- <http://respekt.net/>
- <http://www.kickstarter.com/>

The lending-based

The lending-based crowdfunding or peer-to-peer lending consists of collecting money and in its distribution in form of a loan to a wide range of borrowers, in front of a financial compensation. The collection is intermediated by a web platform, paid for the analysis, selection, and allocation of funds and for the collection of instalments service paid by the financed subjects.

The lending-based model has two specifications:

- a) The classical model - the lender gives money directly to each borrower (with the help of the platform);
- b) The other model - the lender invests in a vehicle that grant credits to various borrowers, absorbing the risks of unpaid and managing the related recovery actions.

It is the crowdfunding model with the most established international experience and regulations.

In Italy, since the banking business, the activity is subjected to the procedures on credit and supervision of the Bank of Italy and CONSOB.

The two Italian platforms operating this model have been requested by CONSOB and the Bank of Italy to comply with the banking and financial institutions laws and regulations and both of them are operating with a banking/financial institution licence.⁸

Law 221/2012 seems to restrict the possibility of raising money online to Italian entities covered by the innovative start-up definition. These provisions could therefore be seen as a contradiction to the clear intention of the European Commission to support the Crowdfunding raising on a wider basis.

The reward-based

The reward-based crowdfunding means financing a project with in return a "reward", a recognition, or an object made with the funds raised or even more complex awards. Based on the kind of the reward offered, it is possible to distinguish the reward-based model into three distinct types, each with a specific discipline,

- a) The modal donation - The best-known type of reward-based crowdfunding is the model that provides for the lenders a small prize, a gadget or a mere acknowledgment (public mention). In legal terms, in Italy this model is part of the so -called paradigm of the Modal Donation, provided by Article. 793 civil code: donation can be burdened with a burden (the reward) whose fulfilment is a specific obligation of the donee.
- b) The pre-order - Other type of reward-based crowdfunding provides a sale or a promise of sale of a future market good, depending on how the relationship is configured. This type of crowdfunding, in Italy, is subject to the legislation on electronic commerce and the Code of Consumer.
- c) The profit-sharing or royalty-based crowdfunding. – it is a type of reward-based that is increasing importance, as to be identifiable as a standalone model. The thing that balances the funding is participation in the business profits: it is therefore a financial prize, corresponding to a share of the revenues or profits of the funded activity, payable under certain conditions and for a certain time.

This formula can be used also for specific business or individual product lines of a company, without involving the other business of the proposer.

In Fact, that contract with the entrepreneur gives the associate a profit share of his company or one or more business in the face of a determined contribution that, in this case, it is only financial.

⁸ Regulation of Crowdfunding in Germany, the UK, Spain and Italy and the Impact of the European Single Market – June 2013; A publication of the European Crowdfunding Network in association with Osborne Clarke

The equity-based

The equity-based crowdfunding involves using the online investment to buy a title of ownership in a company. Thus this method differs from the other models because of the peculiar "reward" expected by those who contribute to the project.

The proponent - that is, the entrepreneur - launches the collection of the loan on the online platform explaining information pertaining to the project and its monetary goal to reach for achieving it. The collection target is divided into fixed-price shares and these are offered to investors. The project, which reaches the minimum collection target, will be achieved in the declared terms and investors will get in return the participation in the share capital; conversely, it will be refunded the amount paid to any legitimate lenders. Therefore, the supporter takes the form of a shareholder who makes an investment and buy a share of the company, in order to obtain dividends from ownership interests and eventually capital gains from the sale of its stake.

The equity crowdfunding market is substantially influenced by the legislative environment of its country. Furthermore, because it involves the sale of a security (Bradford, 2012), and it is thus subjected to various regulatory issues, equity crowdfunding has been restricted until now in many countries, such as the U.S.

To date, the U.K., Ireland, France, the Netherlands, Switzerland, and Australia are the only OECD countries in which crowdfunding platforms are permitted to sell equity shares to small investors. But, as mentioned earlier, the U.S. is expected to deregulate equity crowdfunding by 2013, and this is expected to have a sizeable impact on the equity crowdfunding market.

Despite the regulatory restrictions, most legislative frameworks in OECD countries allow for certain revenue and profit-sharing arrangements. A number of platforms therefore operate in countries where the sale of voting shares through crowdfunding platforms is prohibited, but where profit-sharing is allowed. For example, the German crowdfunding platforms Seedmatch and Innovestment facilitate the sale of silent partnerships (Stille Beteiligung) through crowdfunding platforms. A silent partnership is an equity-like share in a company that gives investors a predefined share of profits but no voting rights. Moreover, the sale of voting rights through crowdfunding platforms is not permitted in Germany, but the sale of silent partnerships is permitted.

Equity-based (usually defined as crowdfundering), in which funders receive compensation in the form of fundraiser's equity-based revenue or profit-share arrangements. In other words, the entrepreneur decides how much money he or she would like to raise in exchange for a percentage of equity and each crowdfunder receives a pro-rata share (usually ordinary shares) of the company depending on the fraction of the target amount they decide to commit. For example, if a start-up is trying to raise €50,000 in exchange for 20

percent of its equity and each crowdfunder provides €500 (1 percent of €50,000), the crowdfunder will receive 0.20 percent (1 percent of 20 percent) of the company's equity.

Pursuant to the Italian Consolidated Financial Law and Italian Consolidated Banking Law, anyone intending to provide investment services in Italy commercially or on a scale which requires a commercially organised business undertaking requires a written licence from the competent authorities (CONSOB and/or Bank of Italy). Investment services are, inter alia, the brokering of business involving the purchase and sale of financial instruments or their documentation (investment broking), the purchase and sale of financial instruments in the name of and for the account of others (contract broking) and the placement of financial instruments without commitment to take up those instruments (placement of financial instruments).⁹

Equity capital investors bear full business risks and should therefore receive full corporate information and control rights in regard to corporate governance. At present, platforms mostly offer mezzanine solutions such as subordinated loans or silent partnerships where the return depends on the corporate profits. Such instruments exclude voting or control rights. Even if national company law does not explicitly offer such solutions, the crowdfunding industry should commit to creating facilities for investors to exercise equity shareholder rights. Governments must ensure under national company law that instruments such as unsecured shares for public offering come with shareholder rights.

4.3 The European Crowdfunding market

The European Crowdfunding market is said to have more than doubled in value between 2011 and 2012, reaching a value of around EUR 1 billion in value in 2012 – a figure to be taken as indicative rather than absolute. This market comprises a variety of different funding forms, such as donations, rewards and pre-sales, consumer lending as well as debt and equity finance for small and medium sized enterprises. Through the funds raised in this way, entrepreneurs have access to capital, create social impact, innovative products and services, cultural variety, jobs and contribute to economic growth. To put this into context, the European Commission estimates that there are some 23 million small and medium sized enterprises (“SME”s) in Europe, 90% of which have 10 or less employees. These SMEs account for around 67% of all jobs and some 80% of all new jobs created. SMEs are therefore of the utmost concern when discussing the economic recovery of Europe's economy. It should be European and national policymakers' top priority to enable SMEs to have adequate access to financial resources. However, according to data from the European Investment Bank, only 30% of businesses are using bank loans while some 40% rely on short-term bank

⁹ Regulation of Crowdfunding in Germany, the UK, Spain and Italy and the Impact of the European Single Market – June 2013 A publication of the European Crowdfunding Network in association with Osborne Clarke

credit or overdraft facilities. On the investment side, venture capital, according to industry statistics, invests in less than 5,000 in high-growth businesses a year and business angels around 1,000. Of the millions of SMEs that are not accessing this formal supply of finance, some will be able to benefit from organic growth and profitability, others will be able to smooth income fluctuations - which are normal in seasonal businesses - through supplier credits or factoring, for example. As a result, a very large number of SMEs, maybe as many as 10 million, rely on their own wealth, their family, friends and fans to invest in growth, support them through economic difficulties or help to purchase new equipment, finance stock and other operational needs. Crowdfunding is proposing to formalise this part of the financial services sector, to make it transparent and therefore accessible, and to combine it with aspects of co-creation and collaborative open innovation. The model can be used to lay the foundation for mobilising funding for SMEs and for sharing appropriate risk. Consequently, it is complementary to both the banking and the early-stage equity finance ecosystems.

4.4 The European numbers

According to the latest report issued by Massolution¹⁰ during 2014 only 1.11 billion dollars (of the 16.2 billion dollars total worldwide) were invested through the equity crowdfunding, the one that moves the lower fraction of the financial volume compared to other models. Up to date, the total venture capital raised by the Italian platforms amounted to over 3.37 billion euros, preceded by the reward-based model with 1.33 billion (of which 92% only in the United States, home of the major platforms such as Kickstarter, Indiegogo and GoFundMe), donation-based with 1.94 billion dollars and lending-based that confirms its leadership with 11.08 billion dollars raised (equal to 68.4% of total deposits). Of the 1.11 billion collected equity while crowdfunding, 787 million relate to North America and Europe only 177 million.

The World Bank estimated that crowdfunding would reach \$90 billion by 2020. If the trend of doubling year over year continues, we'll see \$90 billion by 2017. To put that in perspective, venture capital averages roughly \$30 billion per year and in 2014 accounted for roughly \$45 billion in investment, whereas angel capital averages roughly \$20 billion per year invested. By 2016 the crowdfunding industry is on track to account for more funding than venture capital, according to research firm Massolution's [annual report](#). With an estimated market value of \$34 billion in 2015, crowdfunding has come a long way since its valuation of \$880 million in 2010. In comparison, the VC industry invests an average of \$30 billion each year. Meanwhile the crowdfunding industry is doubling or more, every year, and is spread across several types of funding models including rewards, donation, equity, and debt/lending. In particular, equity crowdfunding – now being [legalised in the US](#) – holds huge disruptive potential.

¹⁰ www.crowdfundinsider.com/2015/03/65302-massolution-posts-research-findings-crowdfunding-market-grows-167-in-2014-crowdfunding-platforms-raise-16-2-billion/

It should come as no surprise that a crowdfunder is the first business in the booming world of FinTech to break through the billion-dollar mark. Small businesses are finding it harder than ever to raise money from traditional sources. Quite simply, banks don't seem up to the task. New bank loans to small businesses in Europe plummeted by 35% between 2008 and 2013. Meanwhile, crowdfunding platforms are enjoying huge support from policymakers in the form of tax breaks, and from institutional investors looking to diversify their portfolios.

Interestingly, the crowdfunding sector with the most potential for disruption is yet to truly take off. If, as expected, equity crowdfunding doubles in size annually over the next few years, it will overtake venture capital as the largest source of startup funding by 2020 (\$36 billion). Equity crowdfunding in Europe has been flourishing for several years, while the US – the birthplace of crowdfunding generally – has been slow in legislating for its introduction.

Currently the US equity crowdfunding market is limited to accredited (professional) investors only. But what happens when an entirely new class of investors – namely 250 million Americans – are empowered to participate and invest for the first time under new equity crowdfunding laws? In theory this would more than double the current European-dominated equity crowdfunding market.

4.5 The Italian Numbers

4.5.1 The Italian platforms

Around 82 crowdfunding platforms are currently available in Italy (October 2015). Of these, 69 are active and 13 are being launched. There is a strong increase compared to the last mapping: 41 platforms were active in May 2014, with an increase of 68%.

Alongside with platforms working with just one of the traditionally recognized models, several new platforms offer more than one model and are defined hybrid. Among the 69 active platforms, 31 (45%) are based on rewards, 13 (19%) on donations, 13 (19%) on equity and 3 (4%) on debt.

The projects presented in the platforms have increased as well from previous mapping (+ 108%), and the overall value moved registered an increase of 85% with 56.7 million euro. The growth is no longer linked, as in the past, the imitation of foreign models of success, but in the sectoral and geographical specialization. However, the rate of success decreases from 37% in 2014 to 30% in 2015.

4.5.2 The geography of the Italian platforms

Most of the crowdfunding platforms are located in northern Italy, with Milan having 16 legal offices and 18 operating headquarters. In Centre Italy: 7 legal offices and 9 operative offices; in southern Italy: 5 legal offices and 3 operative offices.

4.5.3 Target audience

The collected data show that the platforms of crowdfunding are not exclusively addressed to a specific audience. Most of the platforms are aimed at private (82%), followed at associations (74%), companies (67%) and Public Administration (49%).

Between the platforms dedicated to privates, the main model used is the rewards and donations; donations and debt platforms cater mainly to private companies; the ONGs mostly use hybrid, rewards and donations platforms. Public Administration appears to be the target of several hybrid (rewards and donations) platforms.

4.6 Who may access crowdfunding?

4.6.1 Public Administration

Why choosing crowdfunding?

With reference to public bodies, it is called Civic Crowdfunding and means a process of collecting funds by the community for the realization of works and public projects.

Cause: the absence of public funding

Scope/target: attachment to the territory, welfare of the community for joint projects

Result: care for the territory, sense of belonging of citizens, increase in relationships between citizens and public administration.

Local authorities do not have many resources to carry out public works. The project financing does not seem to be the best form of Public Private Partnership (PPP) that allows the public body to take forward urban projects with private support. PAs need alternative forms of financing, addressing not only to the usual lenders (Europe, State, Region, banks, large private companies), but also to subjects like the citizens, the city-users, cooperatives and local small businesses.

Models

There are two methods:

- Total funding: the collection relates to the full financing of the work or project by the community.
- Match funding: the collective financing joins the participation of the administration promoting the project.

For both cases the funds raised by the community are outside the budget of the proponent public body and are bound by it to implement the project.

The civic crowdfunding meets the problems of lack of the administration's budget and allows the realization of works or public utilities which otherwise would have not been realised.

The involvement of citizens and associations in the projects strengthens the bond between them and the PA, with the final result of restoring the sense of community and trust in institutions, with a clear improvement of collective well-being.

The PA has the ability to start an active and direct dialogue with citizens, that:

- will be informed of the administration's decisions in a comprehensive, exhaustive and transparent way.
- will have the ability to intervene in the decision-making process and interact with the administration, proposing ideas and projects and indicating to the administration their actual necessities and priorities, through the actual financing of projects and their success .

The civic crowdfunding therefore could become an important tool for economic and social growth of the community and for its development in a sustainable and transparent way.

The platforms dedicated to the Civic Crowdfunding foresee that draft to be submitted only by PA. Citizens can petition however.

Examination of the projects funded through civic crowdfunding platforms (citizinvestor, neighbor.ly, spacehive, leihdeinerstadtgeld) demonstrates the potentialities of this methodology, arising from aggregating the local community and developing local projects with a positive impact for the whole municipality.

All platforms operating in civic crowdfunding adopt the model of all or nothing. Under this model, the project must necessarily be fully funded. Otherwise the donations made by lenders are not collected or, if collected, are returned. Once presented the collection project can be through one of the previously discussed models, namely the donation based, the reward based and crowdlending.

- donation based crowdfunding: the contributions of individual funders are donations.

In the Italian regulation system the P.A. can receive donations from private parties; it is crucial to examine whether such contributions must be regulated with contracts. According to the Article 783 civil code, donations of moderate value (not related to real estate) are valid even without an official protocol as long as there was the *tradition* (transfer of possession). In the present case, therefore, the PA launches a crowdfunding campaign and accepts the credit given by individual funders without the need to enter into written acceptances. This is true especially if the public body establishes a maximum extent for the individual donation.

- reward based crowdfunding: the contributions of individual funders are not donations.

Although the moral and emotional motivation remains the basis to participate to the crowdfunding, the funder still receives in return a reward which, though not exactly proportional to the value of the contribution, and the PA has to pay out. In that situation, therefore, the PA should foresee a formal in cases where there is a huge disproportion between value of contribution and reward offered. Such possibility is consistent with the provisions of Law 241/90 (art. 1 paragraph 1-bis) by which the PA acts on the basis of private law if outside the authoritative activities.

- crowdlending: the contributions can be framed under the figure of the mortgage.

The loan can be of different duration (determined by the applicant) to the rate offered; citizens can decide to avoid collecting the interests or reducing them, in order to support even more the PA and the community. The obvious advantage for the administration is the possibility to access funding outside the traditional circuits of the banks with lower interest rates. For the citizens the advantages consist of obtaining a better community and of receiving interest higher rates (than those guaranteed by banks on current accounts).

The two major US platforms usually use the reward based model:

- Citizeninvestor: the platform allows governments and non-profit organizations to submit proposals for the public interest, and residents can choose to support.
- Neighbor.ly: the platform accepts only projects proposed by local authorities and public bodies, and works on the reward-based model.

The German platform LeihDeinerStadtGeld operates on crowdlending model: citizens can provide a loan to the PA that wishes to implement a project. Using this platform and this model, the city of Oestrich-Winkel funded the replacement of the analogue radio with a wireless network for the Firefighting Volunteers acting in the municipality.

Some PAs that have already launched a crowdfunding campaign without the support of any platform (so-called “Do-It-Yourself”) have used the reward based model as well. Among these experiences:

- the Rotterdam Bridge pedestrian area construction (2011)
- the Museum of Palazzo Madama (Turin) for the purchase of the porcelain service owned by the Tapparelli d'Azeglio family (<http://www.palazzomadamatorino.it/crowdfunding/>).
- New Yorkers have transformed an underground storage into a public park
- the restoration of the Portico of San Luca (Bologna)

The Italian legislation applicable to public and local authorities:

- the art. 119 of the Fundamental Charter,
- the art. 1 paragraph 1-bis of the law 241/90
- the art. 3, 119, 149, 165, 195, 199-205 of the Legislative Decree 267/2000 (Consolidated Local Government).

In case the authority decides to apply to the donation based or reward based crowdfunding, it should not be necessary to respect the provisions established for municipalities on indebtedness, since in these cases the PA would receive real donations or would offer services with moral value (low cost covered by the contributions received) in exchange of money, so the PA would not weigh on public resources.

Instead if the PA decides for crowdlending, the PA must comply with all law provisions related to debt of public bodies, the constitutional regulations on balanced budget (art. 119 of the Constitution) and therefore comply with the terms and conditions imposed for access to finance through debt.

All sums obtained by the PA through crowdfunding in any form (donation, reward or lending based) will have to be bound to the realization of the project for which they were paid by funders and can not be used for the payment of expenses or other items, except to the extent required by applicable laws (art. 202 and art. 195 of T.U.E.L. -Testo Unico degli Enti Locali, Consolidated Local Authorities-).

This is also necessary for the PA's credibility and for future crowdfunding proposals.

4.6.2 Non-Profit Organizations

Why choosing crowdfunding?

The contact between the givers and asking for donations is easier with the platforms; in addition to that, the chance to follow in real time the progress of donations represents the force of CF; usually for non-profit CF is generally based on the model 'all or nothing': the amount required to be achieved within a set time should be completely gathered, if not, the donations are given back.

Some platforms offer services and features that go beyond classic projects and aim to facilitate the construction of ethic networks, participation and capacity for mobilization from below.

The use of a platform, especially if respectful, has the benefits of acting like a guarantor for the no-profit association and allows to find resources outside of their usual circle of contacts.

The Crowdfunding has proved to be a valuable resource not only for the opportunity to raise money but also to spread initiatives through the network: a sort of amplifier of ideas social, initiatives and projects related to non-profit associations.

Models

In no-profit institutions cash donations represent the usual means to realize their mission; so the crowdfunding models most frequently used are the donation, the reward based and lending. The reward usually is a gift of the product / service that will be realized by the crowdfunding project.

Examples:

- *Shinynote* is a social network to spread 'good stories' to be financed or even just 'embraced' by sharing them on Facebook or Twitter.
- *Uidu* and *Melpyou* offer a meeting place for donors, volunteers, supporters: the portal can be used to post all types of events and requests and thanks to the geographic location search the closest association can be reached and followed.
- *Good cause* allows to support a non-profit initiative with appeals, petitions, fundraisers and social-activism; everyone can become activists and testimonials and ask for donations between their closer friends.
- *Eppela* is the main Italian reward-based crowdfunding platform for creatives, startups and no-profits. Anyone can enter and share an idea, make a crowdfunding project and ask for financing; the all or nothing is applied: when the required sum is not reached, the donors have their money back.

4.6.3 Business and Profit oriented

Why choose the crowdfunding?

Crowdfunding has become an important financing tool also for small private company and for startups.

Cause: difficulties to obtain credit from banks

Scope: produce an innovative project or idea or service

Result: networking and feedback in a short time to determine the success of a new project; marketing to promote products and services not only potential investors but also to potential buyers; create an engagement with the audience

Risk: not achieve the objectives of the campaign; not generate enough interest in the community.

Several new companies decide to launch a crowdfunding campaign to launch a new product and or service with the reward model with the possibility of pre-order or with the donation model but most widely used is the equity model that is specifically dedicated to Start Up and innovative SMEs.

Thanks to the equity crowdfunding high innovative projects can access to a parallel market for raising venture capital. This is the most structured model especially regarding the relationship between the actors involved, that become investors.

Italy was the first country to introduce a specific regulation for equity crowdfunding.

4.7 The presentation of a project on a platform

The required phases for the presentation of a project on a platform are schematised below:

Step 1. the idea

The main points of the work or service to be carried out in the community is presented by the administration or by individuals or associations.

The structure of the proposal should be made according to the logic of business and enterprise creation. The proposer should not launch of a simple idea but also to perform a number of preliminary activities aimed at identifying the content of the project and the assessment of its feasibility.

The project should be assessed by the competent authority, in order to verify the feasibility of the project, to enable all the licensing procedures established by the applicable legislation.

Step 2. The choice of the platform

The choice of the platform that most suited to the project's idea. The proposer, after being recorded to the platform, will forward the request for publication of the project, that sometimes may be subjected to a prior evaluation based on criteria of credibility, feasibility and opportunity.

Step 3. Campaign Planning

Project Description: through images and text the proposer will enter the title of the campaign and a series of contents to suggest precisely the goal of the project, in a fast and attractive way in order to tempt the reader (and possible investor) to read the full description with further details.

Storytelling: several platforms invite the proponents to produce videos intended to explain the project through evocative images of sensations and feelings that will ensure the emotional involvement of the crowd and that provide a clear demonstration of the product or service promoted.

Budget the proposer fixes the budget goal of the campaign in relation to the resources realistically necessary for the realization of the project, taking into account all the fees and costs required.

Promotion: the campaign should be promoted in all the social channels of the proposer (twitter, facebook, blogs, etc.) in order to create a constant flow of information.

5. Crowdfunding for renewable energy projects

Renewable energy projects, including biogas/biomethane plants, might be a relevant field of development for CF¹¹. Given the 'mixed public good' nature of benefits stemming from energy investments (Corradini et al. 2014a,b), mixed schemes can be implemented, where donations in support to projects can: (i) complement other forms of funding, (ii) give projects a participatory framework where value and objectives sharing is concretely linked to resource and benefits sharing: (iii) users/citizens receive back as rewards from participation monetary transfers or project related monetary compensations, in forms of (as examples) energy fee rebates, discounts for fuels that originate from the project activities, etc.

Shi et al. (2016) analyze the effectiveness of instruments for promoting financing for renewable energy projects by using a three-dimension assessment framework based on feasibility, sustainability, replicability

¹¹ See Candelise (2016) for a systematic review of energy crowdfunding platforms.

and use as empirical methods online surveys and the Delphi method to collect experts' assessment. They conclude that the most effective instruments are local engagement, loan guarantee, and start-up grant. Branker et al. (2011) analyse alternative and more participative options to fund renewable projects in Canada.¹²

The interface between users/consumers/citizens and energy providers might be highly diversified. An interesting study by Salm et al (2016) on renewable energy projects in Germany conclude that, based on a large-scale survey of 1,990 German retail investors and conducting a choice experiment with the subset of 1,041 respondents who expressed an interest in investing in community renewable energy projects: *"apart from return on investment, respondents are particularly sensitive to the minimum holding period and the issuer of community renewable energy investment offerings. A minimum holding period of 10 years implies a risk premium of 2.76% points. A subsequent segmentation analysis shows that two groups of potential community renewable energy investors with different risk-return expectations can be identified: 'local patriots' and 'yield investors'".* They show that local patriots are willing to forego returns for local projects, wherein solar photovoltaic is most popular technology, followed by wind and small hydro.

To sum up, the public component of the mixed good oriented project relates to either donating based or reward based non-financial CF, while the private component relates to the financial options of lending or equity CF.

It is worth noting that lending-based CF schemes prevail in 2014 (11 billions), with donation based following second (2 billions). Hybrid schemes gained some momentum (0.5 billion in 2014), while absent two years before in 2012. In the energy sector, there currently exist 20 financial platforms (lending predominates), and 4 platforms for hybrid and 5 for non-financial¹³ schemes each (Candelise, 2016). In March 2016, there were thus 29 active platforms worldwide and 13 in the pipeline.

Another recent survey is contained in Bonzanini et al. (2016), who comment on 84 renewable energy projects financed with debt-based and equity crowdfunding, with the aim of exploring the determinants of the

¹² They note that *"Despite the clear need to reduce greenhouse gas emissions, lack of access to capital and appropriate financing mechanisms has limited the deployment of renewable energy technologies (RETs). Feed-in tariff (FIT) programmes have been used successfully in many countries to make RETs more economically feasible. Unfortunately, the large capital costs of RETs can result both in the slow uptake of FIT programmes and incomplete capture of deployment potential. Subsidies are concentrated in financial institutions rather than the greater population as traditional bank loans are required to fund RET projects. This article critically analyses and considers the political, financial and logistical risks of an innovative peer-to-peer (P2P) financing mechanism. This mechanism has the goal of increasing RET deployment capacity under an FIT programme in an effort to equitably distribute both the environmental and economic advantages throughout the entire population. Using the Ontario FIT programme as a case study, this article illustrates how the guaranteed income stream from a solar photovoltaic system can be modelled as an investment and how P2P lending mechanisms can then be used to provide capital for the initial costs".*

¹³ Horisch (2015) econometrically analyse 583 projects's success (funded). He finds that the environmental orientation is not clearly related to success (the share of green projects is nevertheless low), while nonprofit schemes seem to enhance the project success, as well as the generation of tangible outcomes as rewards

campaign success. They conclude that: “The results show that expected profitability is a key determinant. Promoters of low-profit projects should consider including clauses aimed at leaving economic benefits to local communities, through royalties to public institutions and no-profit organizations, or discounts in energy supply, or engaging local workers in building the plant”. This is an important remark for the development of future projects

In terms of asset collected (Table 2), the average amount raised per project decreases from financial to non-financial projects, as expected. In the EU, the UK and the Netherlands dominate by total amount and amount raised per project. Returns are homogenous given the young evolution of the market, even though a significant range exists between France and the UK, peaking with over 7% return.

Table 2. Performance of crowdfunding projects

- Platforms performance data by crowdfunding model:

Model	Number of projects	Money raised €	Average raised per project €
Lending	219	127,555,407	768,406
Equity (community shares)	38	22,740,049	733,550
Hybrids	40	13,949,090	348,727
Donation/reward	93	814,883	14,050

- Performance data by country

Country	Number of projects	Money raised €	Average raised per project €	Average returns by country	Number of platforms
France	23	1,691,990	73,565	4.21%	3
Germany	87	11,148,740	128,146	5.53%	6
USA	98	12,406,537	126,597	6.29%	8
Netherland	49	20,364,614	415,604	5.58%	4
United Kingdom	121	118,234,845	977,147	7.36%	5

Source: Candelise, 2016

Vasilaiadou et al. (2016) present a specific analysis on the Dutch crowdfunding market (Table 3). The collected money (15 milion) is allocated to a variety of schemes, even at the international level. The paper does not cover biogas and biomass projects.

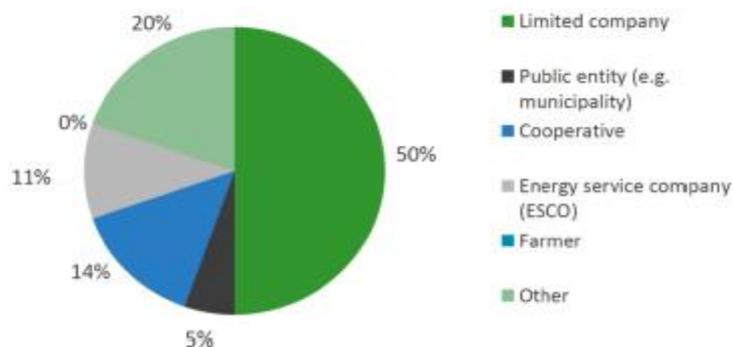
Table 3. Cases of crowdfunding schemes

Summary of Cases.

Project	Product	Project location	Type of crowdfunding	Total investment (USD)	No. of funders/ investors	Rewards/return on investment
A. Efficient Stoves to Protect Pandas	Highly energy efficient cook stoves	China	Reward	\$2500	91	Panda e-cards, drawing, /album
B. "A Flame Called Hope"	Biogas energy	Nepal	Donation	\$2700	66	Social recognition, thank-you cards
C. Pay-As-You-Go Solar Energy	Home Solar Systems	Tanzania	Lending	\$15,000	91	Money
D. SunnyMoney	Solar-powered lights	Zambia	Lending	\$20,000	146	Money
E. Brighter Schools	Solar PV systems	United Kingdom	Debtenture	\$327,600	158	Money
F. Resilient Energy Great Dunklins	Wind turbine	United Kingdom	Debtenture	\$2,123,400	425	Money
G. Caballero Fabriek	Solar panels	Netherland	Equity	\$592,800	186	Electricity/money
H. Wind Eekdo	Wind turbines	Belgium	Equity	\$4,848,700	1825	Electricity/money

Source: Vasilaiadou et al. (2016).

Private agents increasingly use CF to support project development. Diversified agents exploit this opportunity (Figure 6). One interesting issue is the role of ESCO, which present an 11% share in the CF market nowadays. As stated by Pantaleo et al. (2014): "ESCOs can deliver sustainable energy solutions through performance contracting, extending their approaches from the end-user energy efficiency measures to the supply-side energy conservation ones. ESCOs that operate in the distributed and renewable energy field can thus deliver both sustainable energy (in the form of heat, cool and power) to suitable end-users and energy efficiency services". Contrary to energy service provider companies, ESCOs link the remuneration to the performance and can arrange financing for the operation of the energy system.

Figure 6. Role of different actors in crowdfunding schemes for renewable energy


Source: CrowdfundRES, 2015

Source: CrowdfundRES (2015).

Table 4 shows the state of the art of biomass related ESCO projects in Italy. The same source also presents the diversified returns, depending on many factors: the nature and quantity of incentives, including certificate value, biomass costs, baseline fossil fuel price, heat load rate, discount offered, investment costs. This means that a proper and well-designed economic appraisal case by case is necessary, given that the ‘transfer’ of benefits and experiences is hard in a market where the variation around the average performance is still high.

Table 4. The role of ESCOs in biomass projects in Italy

Summary and main parameters of selected biomass-ESCO operations.

	1-a	1-b	2-a	2-b	3-a	3-b
Market segment	Agro-industrial (diary firm)		Tertiary (hospital)		Residential (borough)	
Investment cost for ESCO (kEur)	816	4,623	1,294	5,103	3,351	7,785
Duration of ESCO operation (yr)	5	20	5	20	10	20
O&M costs (kEur/yr) ^a	1,110	1,647	555	1,407	442	1,329
- of which Biomass supply cost (kEur/yr)	1,081	1,323	419	974	301	910
Baseline condition	Existing energy equipment owned by end-user (baseline efficiency in Annex I)					
Baseline heating cost (Eur/MW h) ^b	41.7		58.9		98.3	
Heat load rate (%) ^c	80%	80%	25%	25%	18%	18%

^a Details reported in Annex I, unitary biomass cost 70 Eur/t.

^b Details reported in Annex I.

^c Represents the equivalent annual plant operation at nominal power, and is dependent on the typology of heat demand.

Summary of business models for the proposed biomass ESCO operations.

	1-a	1-b	2-a	2-b	3-a	3-b
Biomass supply	Third part supply with on site storage in charge of the ESCO					
Scope of contract	Total heat demand of load (CHP electricity fed into the grid and feed-in tariff available)					
Ownership ^a	ESCO–customer after first 5 years (BOOT contract)	ESCO	ESCO–customer after first 5 years (BOOT contract)	ESCO	ESCO–customer after first 10 years (BOOT contract)	ESCO
Repayment strategy	Shared savings: Energy Supply Contract with discount on baseline energy costs					
Billing	Consumption based charge					
Outsourcing	Not considered (all services provided by the ESCO)					
Metering	Measurement of energy delivered to the load					

^a Upfront capital provided by the ESCO; customer in charge of civil works for plant construction (case 1 and 2, respectively 50 and 100 kEur) and heat exchanger costs (570 kEur for case study 3).

Source: Pantaleo et al. (2014).

They conclude and summaries the economic analysis of case studies in the sector: “*biomass heating resulted very profitable in case of high heat load rates and high fossil fuel costs. In the case of residential and tertiary sector, the heat distribution costs and the heat demand intensity are key factors. The CHP option requires higher investment costs and presents longer pay back times. The baseline fossil fuel cost, efficiency*

level and the fuel tax level can also make the difference, and the subsidies from White certificates mechanism can provide an important (even if not determinant) contribution to the feasibility of the investments. Biomass cost and involvement of ESCO in the biomass supply chain are also key factor. Further barriers towards the development of these business models are the access to loan, attitude of end users, permitting issues (in particular in residential and tertiary sector), logistic and amenity issues (storage, particulate air emissions, transport constraints, public perception). Moreover, energy price volatility creates uncertainty over the cost of fuel being purchased and energy being sold; this in turn makes it difficult for risk adverse local CHP-DH developers to determine the profitability of a scheme over long periods. Uncertainty over future regulation within the energy sector limits long-term investments and encourages conservative short-term, quick profit decision-making" (p.249).

The renewable energy crowdfunding market has expanded over the recent years. It all started in 2012. Within this, crowdfunding that is devoted to biomass and biogas projects has still a limited scope, but this can be perceived as an opportunity. The rate of success has witnessed to be around 80% across CF schemes in the energy sector (Candelise, 2016).

Candelise (2016), one of the first exploratory studies in the field, has found that the majority (8) of the active platforms are in the USA, followed by Germany (6), the United Kingdom (5) and the Netherlands (4).

Crowdfunded website reports that 'The British groups have been the most active so far'¹⁴. *Abundance*¹⁵, for instance, raised £17.7 million across 17 projects, returning 1.47 million pounds to investors. Three other ongoing projects are being financed with more than £800,000 so far'. The platform is also part of the European project *CrowdFundRES*, which aims to unleash the potential of crowdfunding for financing renewable energy projects¹⁶. In addition, *Abundance* recently raised money for two projects that include biomass (biomass pellets) and one bio-liquid project (recycled waste cooking oil). They have not done any

¹⁴ <http://www.crowdfundres.eu/news/energy-crowdfunding-the-new-way-to-boost-renewables/>

¹⁵ <https://www.abundanceinvestment.com/>

¹⁶ Tom Harwood, from Abundance, interestingly notes that "crowdfunding can be a competitive financing option for many renewable energy projects, but it also typically fills a gap in the market for small-to-medium-sized projects which struggle to get funding through traditional sources like the banks." Furthermore, he says that crowdfunding gives people a direct connection to renewable energy projects, increasing local support for them". Another CEO from a Finnish platform notes that Jukka Kajan, CEO of Joukon Voima, a crowdfunding platform in Finland, wrote "the greatest challenge for upscaling operations is the difficulty of providing projects to actually be crowdfunded".

(<http://www.youris.com/Energy/Renewables/Energy-Crowdfunding-The-New-Way-To-Boost-Renewables.kl>). A stronger attention and emphasis on both the public and private components of value may increase the communication of different and specific potential benefits.

biogas/anaerobic digestion projects yet, although they are working on some potential projects at the moment.¹⁷

Lam et al. (2016) survey case studies of renewable energy projects and highlight that a large part of these projects started as community shared projects (Table 5). They also stress the fact that crowdfunding is not only about money, but may generate both corporate activities and entrepreneurship on the hand, and social awareness about renewables costs and benefits on the other hand.

Table 5. Crowdfunding platforms with renewable energy projects

Overview of platforms with successful renewable energy projects. Hyphens indicate that no data is available.

Platform	Type of funding	Pre-existing business model	Amount of money	Average contribution	St. deviation
<i>Windcentrale</i>	Investment	Community shares	14,342,789	–	–
<i>Geldvoorelkaar</i>	Investment	Customer-owned/Third party	536,200	529	210
<i>Oneplanetcrowd</i>	Reward	all	375,560	881	287
<i>Imiljoenwatt</i>	Investment	Community shares	292,050	1513	–
<i>Greencrowd</i>	Investment	Community shares	224,100	1389	1254
	Donation	Community shares	58,440		
<i>Symbid</i>	Investment	Customer-owned/Third party	50,000	327	–
<i>Doneerdezon</i>	Donation	Third party	17,911	206	220
Total			15,605,000		

Source: Lam et al. (2016)

Crowdfunding for energy has focused on wind and solar energy so far. Biomass and energy efficiency were overlooked¹⁸. Among concrete examples, only Germany seems to present a credible and operational platform, while another US platform seems to have ceased operations. “After a good start,” Candelise says, “there are now obstacles preventing energy crowdfunding from moving forward. So far, the projects that have been funded are principally small-and-medium-sized ones in the wind and solar sectors. Now the challenge is to finance energy efficiency, as requested by the European Union.” But building retrofitting projects, she adds, are more structured and require more expertise (from http://cordis.europa.eu/news/rcn/133434_en.html).

In Italy, the platform Ecomill¹⁹ exists, which is the first energy crowdfunding project in Italy authorised by the regulatory authority, but not yet operational.

In Italy, ANCI promoted at the end of 2016 a seminar on renewables and new funding schemes²⁰. Two crowdfunding schemes were discussed and proposed: equity and reward crowdfunding. Equity crowdfunding

¹⁷ Bio-liquid project - funded in 2016 - <https://www.abundanceinvestment.com/projects/monnow-valley-chp>; Mixed portfolio of solar PV and residential biomass boilers - funded in 2016; <https://www.abundanceinvestment.com/projects/anesco-south-west-renewables> - Portfolio of commercial biomass boilers - funded in 2015; <https://www.abundanceinvestment.com/projects/monnow-valley-biomass> (Personal communication with CEO Tom Harwood, on February 6th 2017).

¹⁸ Personal interview with Chiara Candelise, Bocconi University and IC London.

¹⁹ <http://www.ecomill.it/>

allows the collection of higher amounts of capital (e.g. compared to the reward) and involves the citizen by offering a financial reward. This approach would solve some problems related to district heating projects; in particular, the funding of the high development costs, the internal rate of return lower than the market, offset by ecological benefits, the reluctance of local communities to accept large installation in its territory. Campaigns to reward innovative crowdfunding (Crowdfunding Civic) could instead be taken to address other critical issues, such as ex-ante assurance to plugging in a minimum number of users (for minimum heat density), the need for economies of scale (more connected users, higher profitability-lower prices) and the need of involvement of local institutions²¹.

6. Perspectives of crowdfunding as a participatory instrument

There is scope to extend both the application of revealed and stated preference techniques, on the one hand, and jointly analyzing the feasibility and effectiveness of mixed systems of funding, on the other hand. Both mechanisms – transparent and robust economic valuation schemes, participatory and transparent funding systems – can increase the social acceptance of biogas projects, and comprehensively assess their socio economic and environmental efficiency and socio-political and economic feasibility²².

Economic oriented bottom up involvement of people generates an increase of “participatory democracy”, problem solving processes, and enhances social acceptance as an additional possible outcome. It is linked to what it is defined as ‘deliberative democracy’²³, that is bottom-up oriented public policy processes where people interact with policy makers to reach a decision after a (public) analysis of social and economic issues²⁴. It is thus a complement to economic and financial CBA and other tools.

Gleasure and Feller (2016) conceptually analyse crowdfunding and survey case studies across lending, equity, charity and patronage fields. They noteworthy conclude that CF is not only about money, but about long term sustainability of social interactions within and post the projects: “*platforms need to embrace a view of crowdfunding that treats post-funding development and interaction as core activities, rather than simply an outcome of fundraising. Most platforms understandably focus on each project as a fundraising entity, with*

²⁰ <http://www.crowdfundingbuzz.it/crowdfunding-strumento-finanziario-alternativo-rinnovabili-teleriscaldamento/>

²¹ <http://www.greenfunding.it/> is the first Italian platform devoted to green economy projects. It is still in its infancy, with only 3 million/€ collected out of 4 projects. Green economy projects seem still very marginal.

²² <http://www.qualenergia.it/articoli/20160610-rinnovabili-e-crowdfunding-una-combinazione-vincente>

²³ Theoretically related to works and theories of scholars such as Habermas, Rawls, Elster, Manin, Mansbridge (see (in Italian) the book by Lewanski (2016) - www.laprossimademocrazia.com). The presentation (in Italian) by Rodolfo Lewanski at the 2016 Ferrara sharing festival is available on request (La partecipazione dialogico-deliberativa Sharing Festival Design thinking e lo human centred approach Ferrara – 21 Maggio 2016).

²⁴ It refers to the ancient Greek concept of Isegoria (equality of all in freedom of speech).

commentary and updates treated as ancillary. They also direct marketing and awareness almost exclusively towards projects that are currently fundraising. This makes sense given the commission- based revenue models of most crowdfunding platforms, for which fundraising is pivotal. Yet some platforms are beginning to move away from this, e.g. Kickstarter replaces the fundraising page with an updates timeline after funding is completed, Patreon allows funders to automatically and repeatedly make micro-donations as fundraisers deliver each new piece of content, and Star Citizen encourages funders to contribute art, bug reports, etc. The growth of these interaction-based approaches shows that crowdfunding is not simply about raising money; rather it reflects the next iteration of digitally-mediated collective action. This means funding cannot be separated from the funders, a reality that organisations must respect if they are to suitably involve those individuals.”

Candelise (2016) notes that empowerment is in fact enhanced by these approaches: people can choose where to put money; people can check how money are used; people can participate (community online/socials, to the project itself). A complement theme is that of ‘slow money’ investors at local level. Jajashankar et al. (2015) note that, based on US case studies, “*slow money investors, as fiduciary capitalists, generate financial, social and environmental returns by investing ‘patient capital’ in agriculture and local enterprises*”.

Within the energy market, crowdfunded projects for the development of biogas / biomass sites are still very marginal, but some examples exist in the EU, especially in the actively evolving UK market. Crowdfunding schemes, in their hybrid forms that bring together non-financial donations and equity/financial platforms, might be very relevant for the development of future local projects for biogas, especially where the mixed public good feature of the produced benefits is a topic, and social acceptance is at risk.

In fact, many recent studies, based on the first empirical analyses in the literature, show that the essence and benefit of using CF is not only on the monetary side (funding), but also on the complement empowerment of people, creation of sustainable social capital through democratic participation to public choices and setting of rewarding schemes. This capacity to bring together the profit and public good sides of renewable energy projects is a relevant aspect of CF schemes.

Regulated profits can live with social rewards: (i) profitability and social acceptance, two aspects of a sustainable project – in economic and environmental terms – depending on the ex-ante social and political ‘discussion’ of projects with the community and (ii) ex post generation and maintenance of trust among stakeholders, which is influence by how much economic benefits and environmental gains are generated and how those are shared. Crowdfunding is a brick of the process that can convey important socio-economic developments.

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