Introduction

The lack of access to credit and other financial services is increasingly recognized as one of the biggest obstacles to socio-economic development and poverty reduction. Despite universal financial access has been increasing worldwide (e.g. the number of adults with a bank account has risen from 51% in 2011 to 62% in 2014), full financial inclusion, i.e. access to a range of quality financial services at affordable prices, is still lagging behind (e.g. millions of bank accounts are dormant or used for narrow purposes such as receiving salary) (Kelly and Rhyne, 2015). For some time now, instruments of alternative finance such as microcredit and microfinance have been developed worldwide to respond to such needs and to increase accessibility to capital for the less ‘bankable’ projects.

More recently, the financial crisis have reduced credit opportunities in developed economies, making access to capital for new investments more difficult for citizens and firms. New financing instruments outside the traditional banking sector are emerging (such as crowdfunding, peer to peer lending, SME mini-bonds, social impact bonds, community shares, virtual currencies), particularly in Europe, USA and emerging markets. In this context sits the growth of crowdfunding, a novel answer to the need of access to capital beyond traditional financial systems.

At the same time, liberalization in the energy markets and climate change mitigation policies have been driving a paradigm shift in the energy systems toward cleaner and more distributed energy generation. This has triggered, on one hand, the need for further investments in energy assets and, on the other hand, a quite radical change in the role of energy consumers, leading the way to dynamics of co-provision and customer engagement in the production, delivery and management of energy.

This paper provides an overview of the development of crowdfunding worldwide, pointing out its applicability to the energy sector and the potential benefits accruing from it.

2. What is crowdfunding?

Crowdfunding is an innovative form of alternative finance which allows a project, an organization or a company to raise money from the general public
for seed finance, products development or social causes through open calls via the internet. It began to spread, mainly in USA and Europe, around 2008 in part as a response to the western economies’ credit crunch and economic crisis. The concept of raising money through general public is not new in socio-economic systems (e.g. fundraising is a well-developed practice in the not-for-profit sector (Mullin, 1995)) and crowdfunding falls within a wider group of alternative finance options (including microfinance and impact investing) which have emerged over time as alternative finance mechanisms.

However, what specifically characterizes crowdfunding is the use of internet and dedicated web platforms to raise money. This has been made possible by the widespread adoption of information and communication technology (ICT) and the progressive increasing use of technology-enabled social networks to interact and connect online. Crowdfunding campaigns are based on web platforms where projects are presented to the public and beneficiaries of the funding can communicate and engage with their community of potential donors or investors, and through which people can donate or invest money. Crowdfunding can indeed be defined as an ‘economic superstructure’ of social networks and crowdsourcing.

Crowdfunding models

There exists several types of crowdfunding models, which can be grouped in two overarching categories, which differentiate themselves on the basis of the relationship between those who provide financial resources and those that receive the funds (i.e., recipients):

1. Non-financial or donation crowdfunding, where individuals’ contributions are not associated with a financial return and;
2. Financial or investing crowdfunding, where financial instruments are sold in relation to companies assets and/or financial performance.

Non-financial crowdfunding can be pure calls for donations which are given without expectation of any financial returns or benefit, thus relying on altruistic motives. Typical donation campaigns are run for charitable or public interest causes. A declaration of such model is civic crowdfunding, where citizens’ contributions are used to finance public works or services for communities. Emblematic examples are: Philadelphia city raising 12,875$ to plant 15,000 trees; or Rotterdam raising funds to build a wooden pedestrian bridge with the slogan: “The more you donate, the longer the bridge”; or the Louvre raising €1 million from ~2700 donations to buy a painting by Lucas Cranach, ‘The three graces’.

Another form of non-financial crowdfunding is the reward based model where individuals provide capital to support a project in exchange for some kind of benefit or award; such award could also be the product that will be produced with the capital collected and, in this form, it becomes a sort of e-commerce. Typical examples are musicians who raise funds to record an album in exchange of the copy of the album once released. Reward based crowdfunding has also been used extensively by businesses or innovators, often as a tool to assess demand for a new potential product or service by raising on crowdfunding platforms capital for pilot design and production. Examples of renown reward platforms are Kickstarter and Indigogo based in the USA; e.g. Kickstarter alone raised in 2014 more than half billion dollars from over 3 million of investors and has launched extremely successful campaigns such as Oculus Rift (which raised over $2 million) and Pebble (which raised over $10millions).

The following are the main financial crowdfunding models: lending and equity based crowdfunding. With lending crowdfunding funders receive a debt instrument that specifies future terms of payment, usually a fixed rate of interest. Lending platforms can be peer-to-peer (i.e. lending among individuals) or peer-to-business (i.e. lending to support a business activity). With equity crowdfunding funders receive an equity instrument or a profit sharing arrangement. In this case the returns on the investment are dependent on the company’s performance, thus potentially higher than the case of lending, but also accompanied with a higher risk. A third less common model which is gaining traction more recently is the royalty-based model, where funders receive a royalty interest derived from intellectual property of the fundraising company (e.g. the funder receives a contract that guarantees him a percentage or a fixed amount of the revenues accruing from royalties interest in a company’s intellectual property).
Current market development

Apart from some pioneering initiatives in the early 2000’s (such as lending platform Zopa in the UK in 2005, equity crowdfunding platform ASSOB in Australia in 2006 or reward crowdfunding platform Produzioni dal Basso in Italy in 2005) crowdfunding appears as a wider phenomenon around 2008, when platforms such as Indigogo or Kickstarter have been launched. Since then the crowdfunding market has been steadily growing overtime. The number of platforms has been dramatically increasing worldwide as well as funding volume, moving from about $53 million in 2010 to over $16 billion in 2014 (Figure 2).

North America and Europe are the major markets, but the Asian market is quickly growing experiencing an increase in funding volume of 320% in 2014 (Figure 3).
The lending-based model has the largest market share and has grown most rapidly, followed by donation and reward-based crowdfunding. Equity-based as well as more novel models such as hybrid and royalty based ones are recently gaining more traction (Figure 4).

Note: Hybrid models are platforms that offer one or more crowdfunding models on a single platform.

The innovative nature and the benefits of crowdfunding

Crowdfunding is not only an alternative source of funding, which allows raising funds for projects that could not be financed through institutional channels. Crowdfunding platforms are also powerful communication tools, as they allow full transparency and open communication on projects, enabling investors, stakeholders and communities to engage with the project proponents, get involved and monitor progress over time.

Crowdfunding is thus democratization and disintermediation made possible by the use of internet and social networks which allow people and potential investors to directly browse and investigate investment options. As such it is a powerful empowerment tool, which positions people at the center of economic and financial processes with a participatory ambition. Crowdfunding can also improve efficiency both of the financial sector (by increasing range of investment options for potential investors on one side and by providing funding solutions for projects not bankable in the traditional financial market) and of the real economy (as the validation from the crowd is often used as a test for early stage products and to assess potential demand for a product or service) (Belleflamme et al., 2013).

3. Crowdfunding in the energy sector

Crowdfunding is an interesting financing tool for the energy sector. Donation and reward crowdfunding platform can and have been used to raise funding for environmental campaigns and more specifically renewable energy projects e.g. to fund small solar installations on schools or in developing countries. However, the financial/investing platforms are those mostly used to date in the context of energy and raising higher amount of money. There exists several active platforms worldwide ‘vertically’ focused on the sector, which are already proving to be a powerful method to raise capital in particular for renewable energy projects. Apart for few examples of peer-to-peer lending platforms used by individuals to buy customer owned renewables generation such as domestic PV plants or to implement domestic energy efficiency measure (example are reported on the Dutch platform Geldvoorelkaar), peer-to-business lending and equity platforms are mostly used to raise capital for renewable energy projects (see following section).

Since the financial crisis both governmental and private investments in sustainable transition have been decreasing (Geels, 2013), despite the growing need for financial resources to support clean energy projects. As in other sectors, crowdfunding in energy could help mobilize financial resources and support the transition toward cleaner energy systems. Moreover, the ongoing shift in the energy system paradigm from a centralized (“top-down”) system to decentralized generation (“bottom-up” system) changes the role of the energy end user, who in a decentralized generation system could be both investor and generator. Decentralized energy can thus be part of governments’ and societies’ ‘localism’ agenda, as citizens, communities, local businesses,
local authorities and other public sector organizations can become energy producers and not only ‘passive’ users of a service delivered. As such, they could fully harness benefits and incomes originating from energy investments implemented in their territory.

Indeed, the last decade has seen the increasing development of community energy and shared ownership approaches for investments in the energy sector worldwide (ILO, 2013, van der Schoor and Scholtens, 2015, Yildiz, 2014). These approaches are new business models and structures conductive of greater participation of citizens and communities in energy projects, as such are a form of democratization of energy investments and policy. Crowdfunding, which aggregate financial resources, people and potential investors on specific energy projects have the potential to expand the applicability and the scope of such type of approaches.

Through investing crowdfunding platforms a company, a local authority or a community developing a renewable generation plant or an energy efficiency measure can not only raise capital but also involve citizens and other stakeholders in the investment, allowing them to invest, become shareholders and benefit from the return on the investment itself. According to the type of crowdfunding model adopted (see next section) the citizens can either: 1. lend some money to the legal entity (generally a company or a cooperative) making the investment in the renewable project and benefit from the returns on the investment through an interest payment 2. give money in exchange of shares of the legal entity making the investment, as such benefiting from returns on the investment through dividend payments and acquiring rights to participate to the company or cooperative activities (which vary according to the form of the legal entity, e.g. generally higher in the case of cooperatives, and the type of equity-based crowdfunding model adopted by the platform – see also next section (SpaceTec Capital Partners, 2014)). To give an example, in the UK Plymouth Energy Community Renewables is a limited company installing solar panels on schools and community buildings, which provided to local residents and businesses the opportunity to finance and ‘co-own’ some of this solar scheme by buying shares through a crowdfunding platform (Trillion Fund). Investors would then receive a target return of up to 6%.

Crowdfunding platforms allow people to invest even small amount of money on energy projects and proponents of projects to get access to a large audience of potential investors. It thus provides the possibility to those interested in investing in clean energy, but without suitable conditions (e.g. lack of sufficient capital or of a suitable area to develop the project) to directly contribute to CO2 emissions reduction and benefit from the returns on the investment. In some cases, the communication and public engagement potential, could help in gathering financial resources to support investments less suited for traditional project financing (such as smaller size investments or projects aiming at delivering long-term solutions such as regeneration, social housing or generation in remote areas).

In addition crowdfunding may bring in new types of customers and investors, for instance individuals interested in diversifying their investments and/or experimenting with novel online tools. Recent analysis from a leading UK energy crowdfunding platform (Abundance Generation8) points out that about 34% of their target investors are the so called ‘ethical investors’ (those that actively consider the impact of their investment activities, thus motivated by the ‘green value’ of the investment), but over 50% are ‘financial planners’ (experienced investors, who plan for their financial futures, thus less motivated by the sustainability cause and more by the returns on the investment and the possibility to choose among additional and novel investment options) (Abundance Generation, 2014).

Overview of existing energy crowdfunding platforms, focus on Europe

The market of crowdfunding in energy is still moving its first steps (in 2012 accounted for less than 6% of funding volumes globally (Massolution, 2013)). Still, there exists several operating crowdfunding platforms worldwide dedicated to energy, in particular in Europe and USA. Figure 5 maps most of the energy platforms in Europe (the list is not exhaustive).

Renewable energy dominate platforms’ projects, thus crowdfunding in the energy sector is currently associated with and serves clean energy investments. Among renewable technologies, photovoltaics are the most popular, followed by wind and to a much lesser extent biomass and hydropower. Some platforms are beginning to explore energy efficiency projects (Renewable Energy Crowdfunding Conference, 2014).
The landscape of renewable energy platforms is still fragmented, the concept of crowdfunding in energy is not a commonplace and platforms differ among themselves in particular in terms of:

- The model chosen: lending, equity or hybrid forms;

- Technology focus, with some platforms open to different technologies and others focusing on a specific one (such as We Share Solar in the Netherlands or Mosaic and Sun Funders in the USA focusing only on solar projects).

Some platforms are peer-to-business lending platforms, acting as a sort of virtual energy bank: investments in renewable projects are solicited and launched by the platform providing the investors with a debt instrument which is then repaid and remunerated over time in function of the sale of the energy generated by the projects, with the payments of the returns often administered by the platform itself. Others follow equity models: the platforms raise capital for renewable energy projects and the investors acquire a share of the project, thus directly benefiting from the dividends accruing from project revenues (in the case of renewable generation and energy efficiency the sale of the electricity produced and the savings on the electricity bills). This system works in any case in which there are enough returns on the investment to pay dividends to shareholders. In presence of Feed In Tariffs it is easier of course, as the returns are guaranteed. But there are investments in energy that have (or will soon have) returns even without government support, such as energy efficiency or even PV in areas where grid parity is achieved. It also depends on the country in which you are, e.g. costs of investments in renewables, solar irradiation, policy support vary across countries.

Equity crowdfunding platforms can generally offer:

- direct equity, where securities are directly owned by the investor, thus there is no intermediary vehicle issuing them. It this case the payments can be administered by the company or legal entity making the investment, according to country specific company laws.

- or indirect equity, where an intermediary vehicle invests in the equity of the project and then investors own a share of or other instrument offered by the intermediary vehicle.

There also are hybrid platforms which allow investors to choose among different types of investing options: debt instruments, bonds, company equity or shares in local cooperatives. Usually in this case the platform acts just as an intermediary, thus being responsible only of the crowdfunding campaign (payments of returns to the investment are then managed autonomously by the proponent of the project, e.g. the company, cooperative or in some cases another platform).
Platforms differ among themselves in their models and the way they manage payments and liabilities. For example, Abundance Generation (UK) and Mosaic (USA) do manage payments to investors, while Trillion Fund (UK) does not, as they only act as an intermediary for capital raising on any type of projects: those offering debt instruments (including Abundance Generation’s projects), equity or community share.

It is a very new market, without standardized procedures and regulations yet, thus each country and platform adopt different solutions. From a pure regulatory point of view in some countries, e.g. in the UK, crowdfunding campaigns are structured for a specific project (and platform operation) using both a debt or equity structure (or some mixed forms).

Table 1 summarizes the main characteristics and numbers of the major platforms worldwide, based on the money they have raised so far. The prevalence of United Kingdom (UK) platforms are among the most successful to date is noticeable, a result of the country’s European leadership in the crowdfunding market (accounting for over 74% of the European market (Wadrop et al., 2015)). Despite regulatory frameworks still differ from one country to the other (in Europe work is ongoing to harmonize regulation across countries, but it is still work in progress (EU Commission, 2015)), investing crowdfunding platform are mostly treated and regulated as financial institutions, thus are usually required to apply for some form of authorization from the national financial authority and to act in compliance with Markets in Financial Instruments Directive (known as MiFID), whose main objectives are ensuring market efficiency, competition and consumer protection in investment services (despite some MiFID exemptions do apply mainly to simplify processes to allow smoother transactions) (ESMA, 2015a, SpaceTec Capital Partners, 2014).

## 4. Crowdfunding in Lebanon

Live Lebanon, a UNDP managed project has been established in 2010 aiming at supporting underprivileged and overlooked communities in Lebanon. A call for proposals is launched every 18 months in collaboration with the municipalities in Lebanon; around 350 project proposals are received per round. A panel is established comprised of the personnel from the Live Lebanon project, goodwill ambassadors and UNDP personnel to evaluate the project proposals and refine the potential proposals to 60. The Live Lebanon team then performs site visits to the 60 pre-selected proposals, in order to validate...
the data provided and further shortlist proposals. Feasibility and budget studies are then completed by the team and 20 to 30 projects are retained, normally projects budget range between 40,000 and 70,000 USD. Project documents are created and posted on websites and platforms for crowdfunding.

Live Lebanon plays the role of crowdfunding agency for pre-selected projects to be implemented in several regions in Lebanon. Crowdfunding, which falls under the donation based scheme is done through six main streams:

- The live Lebanon website (http://livelebanon.org/); a “donate” tab is available on the website through which interested donors can choose the project to which they would like to place their contribution. Once the target budget has been raised, the website indicates so, and still interested donors would be asked to select a different project

- The Zoomal platform; a one year partnership has been recently signed between the UNDP – Live Lebanon project and zoomal to help crowdfund for the ongoing and future projects

- Alfa / Touch donation application; Live Lebanon are currently working closely with the available telecommunication companies in Lebanon on an application that would allow interested users to donate to the line of projects to be implemented

- Bank Account; a bank account is available at the BBAC bank to which donors can directly place their contributions. Contributions cannot exceed 1,000$ due to bank regulations

- Goodwill ambassador; celebrities, immigrants and interested people give donations of certain amounts as a way of giving back to the communities

- Directly to the UNDP office; this stream has been set up due to the Lebanese banks rules and regulations that limit the amount of money deposits to any bank account; there is no limitation to the donation amount

In all streams, except for the direct bank account deposit, the money is transferred to Live Lebanon's bank account upon signing an ACA (accelerator cash account).

Donors have the choice to donate to a certain pillar (healthy Lebanon, Green Lebanon, Young Lebanon and Prosperous Lebanon), city or project. To date, 40 projects belonging to the four different pillars of the Live Lebanon project have been implemented, 6 of which fall under the “Green Lebanon” pillar, 4 are ongoing and 25 are still at the fund raising stages. Over the past 4 years of operation, Live Lebanon was able to raise 1,650,000 USD for project implementation and 800,000 USD for running cost.

Once projects reach the required fund, the implementation process starts and Live Lebanon provides weekly and monthly progress reports to donors. Once the project is completed, donors are invited to the inauguration along with representatives from the UNDP.

There are cases where goodwill ambassadors raise money for a specific city and ask the Live Lebanon team to hunt for a project in the said area. This was the case of the largest project implemented to date, the solar street lighting for Marjeyoun in the South; 120,000 USD were raised by Mr. Ghaleb Farha, Goodwill ambassador for the Arab Gulf Region.

5. Concluding remarks

Crowdfunding is an emerging business model and a socio-technical practice with the potential of upscaling and transforming both the energy and the financial sectors. The numbers show how crowdfunding is actually making access to capital more accessible for the general public and is unlocking financial resources for those that previously did not have access to traditional finance market.

Growing interest in developed and emerging economies

The European Commission has identified in crowdfunding a relevant financing tool in support of SME (Small Medium Enterprises) within a package of measures to support EU economic growth in March 2014 and in its recent Green Paper on Building a Capital Markets Union (EU Commission, 2015). In this context the importance of non-banking sector is recognized in helping access capital as well as making a shift from debt to more equity funding (ESMA, 2015b). Moreover, “crowdfunding has also high potential benefits for innovation, research and development, and it could contribute to growth, community development and job creation while financing innovative projects that do not have the level of maturity that traditional financial market sources require. Compared to other types of finance, it can also reduce costs and administrative burden for enterprises, notably SMEs” (EU Commission, 2014).
World Bank highlights its potential to support innovation and economic development in the developing world, “leveraging reservoirs of entrepreneurial talent and capital currently dormant in developing and emerging economies” (World Bank, 2013). However, crowdfunding, in particular financial models, are currently largely a developed world phenomenon and have achieved the major results in countries where there already exists a developed financial sector. In other words, it seems that crowdfunding to be effective needs to be placed within a fairly developed financial value chain. In particular if used to provide capital to SMEs, it has to be seen as a step within the financial lifecycle of growing firms (Figure 6).

Thus it is advised that for developing and emerging economies to benefit from crowdfunding potential it is important to learn from developed world experience, in particular in understanding enabling factors, potential risks and how to mitigate them. Primary conditions are:

1. A clear regulatory framework, in particular for financial models which are forms of investment services and, as such, needs to be regulated according to national (and European) financial services regulatory guidance. The regulatory framework from crowdfunding is very new and still evolving (the first formal equity crowdfunding regulation has been implemented in Italy in July 2013), but it generally aims at guaranteeing consumer protection, avoiding risks of frauds and complying with financial market efficiency principles.

2. Reduction of digital divide, improving access to reliable internet and mobile data networks;

3. Clear cultural strategy to involve both existing value chain stakeholders (e.g. local entrepreneurs, incubators) and the general public through social networks and local engagement.

Democratization of the energy sector

The strong elements of democratization and disintermediation intrinsic in the crowdfunding instrument make it a suitable tool for financing as well as stakeholders’ involvement and participation for distributed clean energy projects. Crowdfunding can not only help in reducing access to capital barrier and increase accessibility to finance for less ‘bankable’ projects. It also allows for income redistribution and social participation in energy projects. As such it can help to minimize the Nimby syndrome (Not In My Back Yard movement), maximize local returns on the investment, foster local participatory processes and empower people. It is a powerful tool of communication and aggregation (facilitated by internet and social networks) which could foster and amplify the already ongoing processes of democratization and participation in the energy sector (Kunze and Becker, 2014), thus increasing societal support for renewable energies and, in turn, political support.

Notes:

1: As of January 2014 it is reported that around 74% of online adults use social networking sites PEW RESEARCH CENTER 2014. Social Networking Fact Sheet. Available at: http://www.pewinternet.org/fact-sheets/social-networking-fact-sheet/.
2: Crowdsourcing is the process of obtaining needed services, ideas, or content by soliciting contributions from a large group of people, and especially from an online community, rather than from traditional employees or suppliers.


4: https://www.indiegogo.com/, https://www.kickstarter.com/

5: UK donation platform for solar projects on schools http://www.solarschools.org.uk/

6: Such as Pollinate Energy raising funds for projects in India, http://pollinateenergy.org/

7: https://www.geldvoorelkaar.nl/geldvoorelkaar/startpagina.aspx

8: https://www.abundancegeneration.com/


10: As in the case of Abundance Generation’s (lending platform) projects launched on Trillion Fund (hybrid platform), in the UK.

11: For example the Italian regulatory framework is more restrictive than other European countries, as only equity crowdfunding is allowed by the national financial authority, whereas in other countries such as UK crowdfunding platforms can provide one or more other forms of crowdfunding, ranging from bonds or debentures, through loans to rewards.

REFERENCES


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