Management and financial tools for housing regeneration

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Short Summary

Social housing stock in Italy is actually in a profound state of decay; it shows multiple critical elements that range from poor overall energetic performance, to traditionally lower class occupants with related difficulties in solvency to the scarcity of available economic resources needed to act on it in adequate manner. The concept of a building as an energy consumer is well understood and has been ingrain in all plans linked to energy saving. Limiting energy consumption has become the key point of all policies, laws and regulations issued in the past ten years. We can add to this the paucity of available economic resources. Based on what I have outlined, is important to identify the possible economic and managing tools that can generate usable resources to requalify social housing. This becomes possible by linking together the building’s potential characteristics switching from an energy consumer to an energy producer view, analysing the technical capabilities that come from the exploitation of renewable energy sources (i.e. photovoltaic). The revenue that comes from the sale of the energy produced by the building can create an interesting investment opportunity, albeit without the profit margins that come with traditional investments, and with a longer ROI.

The concept of the building as an energy producer is one that generates a worthwhile reflection in the search for new paradigms needed to close the gap between the need to intervene and the scarcity of economic resources for residential housing. Due to the evolution of technical solutions for building envelope ever more performing in terms of thermal comfort, and building systems (in particular for thermal and electrical photovoltaic systems), the possibility of having surplus energy with respect to the building’s consumption resalable on the market has grown. This surplus (there are a number of case studies on the subject in Italy and abroad; we mention here the pilot study in the town of Reggio Emilia in the FRESH European framework) represents the keystone to radically change the concept of all that purports to the production and management of the housing. The operators who will be capable of working in this revolution are, thus, companies that deal with energy. Escos (Energy Service Companies) in particular come into play both in new developments and in requalification through third party financing operations, bearing the full cost of the operation and obtaining a revenue from the energy bill before and after the operation.

**Keywords:** Social housing, energy management, economic and financial processes, public-private partnership
1. Introduction

The research, policies, strategies and operational tools that revolve around the theme of “social housing” are going through a period of profound change in Italy. The term “social” is changing its meaning in relation to both the building stock of reference, and to the target users, and to any operational possibilities for the planning and implementation of interventions.

The term is used to indicate housing designed and built to satisfy the basic need of housing in relation to a user group that is not able to access the free market. They are traditionally houses built by the state using non-repayable economic resources. Because of the conditions of low solvency of the user group, and the inability for the public administration to make a return on rents, blocked by the fair rent mechanism, social housing is usually considered in terms of the budget as an item of expense necessary to cope with a social emergency.

It is necessary, however, to distinguish between the interventions of Economic and Popular Construction (Edilizia Economica e Popolare - ERP) and those that are more generally referred to as social housing, intended for the poorer part of the population, constructed by a special agreement between the builder (usually a cooperative) and the public administration. In this case, the rents are still controlled, but provide higher figures than those of the ERP.

Most ERP interventions took place in the period of economic boom in the years ‘50-‘70, in an age of widespread speculation and employed technical solutions aimed at solving a problem of quantitative emergency rather than directed towards quality building. The urgent need to renovate this heritage to make it functional at least with respect to the starting conditions of use is strongly felt and necessary today.

To this situation is added the need to deal with the environmental emergency, with the demand for evermore efficient performance parameters relating to fuel economy, the performance of the building shell in terms of thermal insulation, and the operation and building organism in both winter and summer.

Welfare policies in Italy in recent years have come to a grinding halt because of the ongoing economic crisis. The public administration presently does not have access any more to its traditional channels of procurement; non-repayable resources are disappearing, and, again because of the economic crisis, the portion of the population that might require accommodation in a subsidised rent setting is constantly growing. The central problem today is therefore the difficulty in redeveloping and managing the social housing assets; the reasons for this difficulty have to do not only with the need to improve technical performance, but above all with the scarcity of available economic resources.

2. The crisis in the social and economic sector

2.1 From the lower-middle and middle classes to the grey users

Until a few years ago the target users for social housing were made up exclusively of people belonging to social categories at risk, with no income, who accessed ERP rankings more easily the more their general living conditions were considered to be precarious. It was a social class that, all things considered, was homogeneous and stable, in which the conditions of poverty and lack of cultural education went hand in hand, very different from the lower-middle and middle classes who could usually access the private building market.

The crisis and the ongoing economic uncertainty has impoverished and rendered unstable segments of the population that previously formed the backbone of the Italian social fabric, creating a new category of user and one that is difficult to place within well-defined boundaries.

It is a group of “grey” users, with changing and undefined characteristics, no longer economically stable, borderline, which can live in relative economic ease at times and at others slip below the poverty line. This user category has features in common with the bourgeoisie from which it comes as well as with the target users of affordable and popular housing, among which the most significant is the lack of economic stability required in order to gain access, for example, to a traditional bank loan.

The presence of this group of users, which is so fragile and numerically increasing, makes the question very complex and problematic. The crisis affecting the social housing sector is closely connected to the crisis that is affecting the construction industry in general, also with respect to the private housing market.

The marked difference that existed one time between users who took advantage of lodgings at controlled rents and those who turned to the free market of renting and buying is no longer so clear. The separation between the lower middle class and ‘grey’ users is increasingly blurred, because entering into crisis is the whole area of the middle class, increasingly devoid of fixed points and security with respect to the labour
The data for the annual CENSIS report on the situation of the country in 2012 show a worrying and widespread situation. The collapse of the economic capacities of the middle class is evident (there has been a collapse of the share of wealth of the middle class of between 50,000 and 500,000 euros, and including real estate, which declined from 66.4% to 48.3%), and this occurred in favour of the already well-off segments of the population (the proportion of households with a net financial wealth of more than 500,000 euros in fact doubled, from 6% to 12.5%). The social divide has increased at the expense of middle-income classes. Over the past ten years, in fact, net financial wealth has gone from 26,000 to 15,600 euros per family, a reduction of 40.5%.

It is important to consider that one of the characteristics of the grey band is a capacity to produce income albeit in a discontinuous manner. So it is not only the population that is traditionally not solvent that is the recipient of affordable and popular housing, but people who are working on a casual basis, that is, not constantly enough to gain access to the free market (for example, to get a bank loan), but at the same time with an economic power that exists even if it is variable depending on the labour market. The grey band is the place where we find the “jobseekers”, identified by Censis 2012 as a segment of the population that is increasing (+34.2% between the first half of 2011 and the first of 2012), active, relatively young (between a quarter are 35 and 44 years old, another quarter in the older brackets, while the others are under 35) which is currently being pressed by the current economic situation due to the lack of job prospects.

The expansion of this user category is also invading segments that up to a few years ago were destined for the private market, broadening the question to what is defined as current residential construction, i.e. the portion of the housing stock typically allocated to the main house of the middle class.

### 2.2 The collapse of public and private investment in the construction industry.

Everything that has to do with building in Italy, and not only social housing, has suffered a sharp decline in recent years in terms of the economic resources available and possible investments. The collapse of the private housing market has affected a sector that traditionally was able to drive the overall economy of the country in a very strong way, contributing significantly to the stagnation of the current economic crisis. This situation is fully described at various territorial levels. The European Commission Communication to Parliament and the Council of 31/07/2012 (COM2012 433 final) on the Strategy for the sustainable compatibility of the construction sector and its enterprises underlines (referring to the Eurostat press release 169/2011) the presence of a severe crisis in the construction sector, with a drop in the carrying out of building and infrastructural works of 16% occurring between January 2008 and November 2011. At local level, referring to the city of Rome, a relevant indicator of this situation is provided by the decrease recorded within the private housing market. From the note published by the Territorial Agency for the Valuation of the Real Estate Market in the first quarter of 2012, a decline of 20% in sales compared to the data of the previous quarter was witnessed.

If the construction market is in crisis, equally in crisis is the situation regarding access to public resources that can be spent on housing and in particular on social housing.

Public resources currently available and in the process of disbursement cannot alone solve the problem because they are not sufficient to put in place extensive programs of intervention on the housing stock. The concept is disappearing of the disbursement of resources in the form of non-repayable grants, because those provided are not sufficient. These resources also, where available, are not always adequately used. Given the conditions of low solvency in the user group, both in relation to that which traditionally was the recipient of ERP housing and considering the grey band, more solvent but variable, it is not possible to consider the construction and management of social housing as a profitable investment in relation to the absorption of rents. In some cases, the resident population in social housing is not only not able to bear the cost of the rent, however reduced, but not even able to pay energy costs, generating the complex phenomenon of fuel poverty.

One of the key issues is therefore related to the possibility of attracting investors interested in operating in a segment of the housing stock that traditionally has been unprofitable; the very investors plunged into a comprehensive crisis by the economic crisis. If the public administration is no longer able to bear the costs for the redevelopment of social housing, it is equally complicated to turn to forms of public-private partnership. It is necessary to attract the interest of someone willing to invest in a sector that does not pay, a supposed “cold work” to use the term from project financing, destined, that is, at least apparently, to not produce income.
3. Energy management as a resource

3.1 From consumption to energy production

To the question of the possibility of having a space to live, we have to add that of lowering the consumption, and therefore the costs, related to the energy management of the building. In Europe, social housing is made up of approximately 25 million housing units, of which more than half have an energy consumption of over 150 kWh/sq.m/year. In Italy, the social housing stock is traditionally “dated” in time and built between the early 1900s and the ‘50s and ‘60s. 80% of this stock needs energy upgrading. The policies of the last decade have made great strides in this direction dealing with the issue of limiting consumption, with the aim of creating building structures that are as self-sufficient in terms of energy as possible, all the way to considering the building not as a consumer but a possible energy producer. Because of changes in the energy market in fact, the ability to produce energy independently of the networks of national production has been made possible by the spread of large-scale technologies related to solar energy. The spread of procedural and economic mechanisms for the autonomous management of energy, the presence of state incentives for the diffusion of these same tools, and a growing widespread awareness of environmental issues, is leading to an increasingly large number of individuals choosing to operate in this field.

The concept of energy sustainability is now closely linked to economic sustainability; we assume the cost of installing plant capable of producing energy because this has advantages at an economic level that are perceptible albeit in the medium and long term. The market also is rapidly absorbing the growth and spread of new products able to operate in this way.

At the basis of the concept of economic sustainability is that of self-financing; creating a building structure that is autonomous in terms of its needs regarding plant operation means becoming independent of the traditional channels. It is precisely the energy market operators, primarily the ESCOs (energy saving companies), private companies which invest by paying the costs relating to the intervention, in the expectation of a financial return that comes from the management of the same, that are able to offer possible solutions as regards it.

Thinking in terms of energy production may represent an element of interest for those who are able to make a profit from the management of the same, freeing themselves from the condition of being resident users. A structure with high energy efficiency also improves its functioning (and therefore its performance in economic terms) if the general conditions of the same, the shell and plant, are optimal.

This kind of operation is possible through the use of appropriate management and budgetary tools. The intervention of the ESCOs is in this sense a great opportunity. They have an interest in improving the energy functioning of a building because they can achieve a profit from the management of the same, through instruments (such as energy performance contracts) that guarantee the ESCO a profit that comes directly from the collection of the energy saving. In layman’s terms, the more a building consumes less and produces more, and the more the energy bill is lowered, the more the ESCO is able to earn. The redevelopment of the building stock, with the consequent increase in technical and energy performance, offers, in this sense, an interesting perspective.

3.2 The European Project FRESH and the pilot case in Reggio Emilia

A case study in this sense is represented by the European Project FRESH (Financing Energy Refurbishment for Social Housing), which has just ended and whose results are being evaluated, which in Italy was carried out through a pilot case in the Municipality of Reggio Emilia.

The project opened up a discussion whose aim was precisely that of reflecting on the relationships between the various parties involved in operations of third-party financing with the help of an ESCO. In particular it has used, analysed and implemented the forms of contract that can be stipulated in these cases. The EPC (Energy Performance Contract) contract is proposed as a large-scale solution (but applicable and improvable in line with specific cases) for energy upgrading in social housing.

The project was carried out with a number of experiments that took place through contracts in several states of the European Union on upgrading the energy efficiency of buildings destined to social residential use. In particular, the countries involved were France, Italy and the UK. The buildings chosen as pilot projects were built in the ‘80s, with the prevailing construction technology based on the use of concrete with a high consumption of resources in the phase of use.

The Italian pilot project consisted in entrusting the provision of energy services in a building for public residential use under the management of the Reggio Emilia ACER located in the Municipality of Reggio
Emilia. It is a small building (a total of 13 apartments), built in the ‘80s. The building envelope was made with precast concrete panels with an interposed insulating panel; the air conditioning plant, run on natural gas, did not ensure adequate performance in energy efficiency.

The call for tenders involved the renovation of the heating system in order to obtain enough savings in fuel consumption that could repay the intervention itself as well as the cost of the energy service made up of the conduction of the air conditioning systems (inclusive of extraordinary maintenance) and the operation and maintenance of heating systems, as well as ancillary services including the provision of fuel for the heating plant in winter.

The main objective of the intervention was to achieve in the first year of activation energy consumption savings of 35% in terms of primary energy use as well as a reduction in energy costs of at least 35% of the expenditure currently incurred. The project is now finished, with satisfaction on the part of the users both in terms of savings and quality of life.

The profit for the service contractor, in this case, comes from the retention of a portion of the energy savings achieved through the redevelopment. From the collection of that fee, which occurs for a given number of years stated in the contract, also comes the coverage of costs incurred in the intervention. It is obvious that the success of such operations depends on the ability to use the technologies available on the market and to organise both technical and managerial competences.

4. Open issues and possible strategies

4.1 Self-reliance and economic sustainability

The goal of economic sustainability, understood as self-reliance, can be pursued only through a careful reflection on the instruments currently able to operate in this way.

The open questions on the subject, which have to be answered in the near future for this revolution to become feasible at the operational level, involve various aspects.

4.1.1 The operators in the energy market: problems and potential

The first aspect concerns the operational difficulties encountered by those working in the energy market. The problems deriving from the spread of forms of partnership involving the intervention of ESCOs are of a different nature. On the one hand, a low diffusion of the phenomenon corresponds to a lack of knowledge of the same. The disbursement of a loan granted to an ESCO by a bank, for example, can no longer be connected to the existence of any guarantees (as is the case in traditional lending mechanisms), but to the obtainment of the promised results in terms of improvement in energy performance. The evaluation of this type of factor presupposes the presence of adequate technical knowledge, not yet possessed by the operators present in the market.

The skills required of an ESCO, on the other hand, range from the technical to the managerial and financial, since the ESCO proposes to manage the operation overall. The purely technical and financial aspects, moreover, are more closely connected than in the past for other management operations of the housing stock, given the close connection between the savings achieved and the use of technical equipment capable of generating precisely those savings. To this is added the difference in performance compared to operations carried out in the construction market. In the phase prior to the start of the economic crisis there was a period of great speculation, with very high earnings for builders and investors. Currently the instruments connected to third-party financing with the help of ESCOs provide longer payback times with earnings that are lower and diluted over time.

To this is added the relationship with users; they, while no longer entering the game as potentially paying customers, are the recipients of the interventions, and have to be assisted in order to work together to make the right choices. Given that users traditionally resident in social housing do not have the appropriate skills to fully understand such complex interventions, there is a need for great transparency and simplicity in communicating what is actually being accomplished.

4.1.2 Possible public resources to guarantee private investments: the Funds

The need to entice ESCOs to enter a market that is traditionally unprofitable led to the birth of funding mechanisms through Funds, particularly the funds of the Cassa Depositi e Prestiti (Deposits and Loans Fund). The ESCOs are considered, in this case, as possible beneficiaries such as private citizens and condominiums,
or as public bodies, for certain types of intervention relating to the improvement of the building shell and plant through appropriate and/or innovative technologies. The Cassa Depositi e Prestiti is a joint-stock company 80% controlled by the Ministry of Economy and Finance. It is subject to minimum reserve requirements by the European Central Bank as all banks are. The resources it channels through the funds therefore are not grants, but real investment arrangements that foresee the interest of a bank and the possibility of a return, through which it is possible to finance the fund itself. Such a return, albeit non-speculative and with low margins, must be present. Since 2009 the operations of the Cassa have extended to the possibility of financing projects of public interest such as those related to social housing. Among the available and active funds and the financing channels promoted by the Cassa Depositi e Prestiti is the revolving Kyoto fund. This fund has an initial budget of 600 million euros. The fund is called “revolving” insofar as it is fed with the instalments of the repayment of loans, and has been available and operational since 16 March 2012. It can be used and combined with other incentives, such as those relating to the issuance of Green Certificates, Third and Fourth Energy Account, and incentives for the production of electricity and heat. Between 2012 and 2013 the objectives of the fund have remained essentially the same with a few variations. The request for funding in the years 2012 and 2013 was very high, and exhausted very shortly after the activation of the requests, which could be made through an IT portal. The same concept forms the basis of the European Energy Efficiency Fund (EEEF), connected with the European objectives of 2020-20. In this case too, possible recipients are the ESCOs but also the social housing associations. The concept behind this type of instrument is that of attracting public and private capital to promote partnership initiatives aimed at solving environmental problems. The importance of this modus operandi is fundamental from the point of view of seeking to create forms of guarantees for investors operating in sectors of high risk and collective interest; the impulse coming from the public administration in terms of incentives is very important to create the initial lever to trigger a mechanism of this sort. The same concept is at the basis of the operation of the incentives for the production of energy from renewable sources, which have increased energy production from photovoltaic sources enormously in recent years. The report “Statistical data on electricity in Italy in 2011,” by Terna shows, in terms of net production, a decline in thermolectric production (218.5 TWh against 221, -1.1%) and hydroelectric (47.2 TWh against 53.8, -12.3%), and a significant increase in the contribution of the other renewable sources of wind, solar and geothermal (25.8 TWh against 16, +61.2%). Among these photovoltaic is the most relevant technology, because of the enormous increase of production recorded which is equivalent to +499.2% (10.7 against 1.9 TWh) which has far exceeded the already very considerable result of 2010 (+177%). In 2011 the number of operating photovoltaic systems reached 330,306 (of which 174,329 were connected to the grid in the last year of reporting).

4.2 From the building to the city

The idea of energy self-production involves not only the operative possibilities on single buildings, but more widely the satisfaction of a need of a collective character.

The analysis carried out on the possibilities of intervention on a building stock that is problematic both in terms of the intrinsic characteristics and the conditions of the users, such as those of social housing, reveals potential for use by reasoning on a different scale, that of the city.

Going up in scale, in fact, and considering the possibilities for energy production no longer from the single building but from the block, the sector, the small size of the neighbourhood, we enter into the logic of the smart city understood as a set of individuals working collectively to solve single problems. From the point of view of energy production adding together the energy production of groups of houses rather than focusing on the efficiency of individual buildings is undoubtedly more productive in terms of the amount of energy produced and possibly residual energy as a surplus to be placed on the market. If it is this surplus that acts as a lever to move from the concept of a building as energy consumer (with the resulting energy savings in various forms), to a building as a structure that is energetically as independent as possible (aiming for the solution of the passive house at zero consumption), to a building as producer of energy (deciding how to use the energy produced) and as a producer of economic resources, it is necessary to find a way to develop collective strategies to help this become possible. The conditions of the built heritage in Italy involve an urban core that often is very compact, and for this reason concentrating on the production efficiency of a single building is not always convenient precisely because it operates within a built context in which the technology linked to solar collection cannot always be effective. The energy efficiency of a technological solution can be influenced by the relationship with other buildings, in terms of orientation, shadows, management issues, the shape of the building itself. The same house if transported to an empty
space with the right exposure could make much more energy if it were not wedged in a built-up area that is often very compact; but at the same time the presence of a compact built-up area, with buildings similar in their original constructive technology, and numerically significant, allows choices to be made that are more convenient by adding together the energy production of a number of units.

5. Conclusions

Thinking in terms of buildings as potential producers and not just as consumers of resources, and using the earnings resulting from the management of the energy produced from the buildings for the redevelopment of the social housing stock, can bring benefits both in terms of the quality of life of the resident users and in terms of new investments to be made on the market, generating a potentially effective economic induced activity.

The social housing sector has been, in recent years, the subject of numerous research projects in Italy and abroad, mainly aimed at the development of innovative solutions especially at the technical level. These solutions, without adequate financial resources to allow their large-scale diffusion, risk remaining examples of an excellent technological level but destined to have a low take-up in practice, limiting themselves to the development of prototypes of a very high technological quality and high-impact innovation, but without the possibility of becoming widespread on a large scale. Within this framework, it is important therefore to consider the connections between technical possibilities and the management-economic ones that can be used to promote the redevelopment of the social housing stock in a concrete way.

To summarise and conclude, the two main issues that need to be developed in the near future relate to:

- The need to make interesting and appealing to the eyes of a private investor possible redevelopment interventions on the existing. This need might be addressed by linking redevelopment to the introduction of systems and technologies for the production of energy. The ultimate goal is that of redeveloping in a sustainable manner, considering the economic aspect, above all related to energy production linked to the introduction of photovoltaic systems. At the basis of this type of intervention is the overturning of the common way of thinking about the house as something that consumes resources, focusing rather on the fact that through the introduction of appropriate technologies it is possible to produce energy resources which, if managed correctly through the use of appropriate management tools, can be transformed into opportunities to produce economic resources. These opportunities range from the possibility of using the energy produced for the running of the home and the services related to it, in order to create a structure that is as independent as possible from the point of energy.

- The need to think in a collective way rather than stopping at the individual instances of the single case. This request comes from considering the request for energy/economic production collectively, no longer being interested in the single building but in groups of houses arranged in blocks, sectors, larger groups than a single building. This is how possible solutions to a problem like the apparently limited one of social housing can be used for the redevelopment of a building and social fabric that is numerically much more significant and complex. This involves on the one hand the possibility of producing energy in a more rational and efficient way, but the other leads to problems both from the point of view of the management of the service and from the point of view of the management of possible initiatives.

A reflection undertaken to solve a social emergency can be transformed, if properly managed, into a resource capable of generating mechanisms that can also be used elsewhere with potentially beneficial effects for the rest of society.
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