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Introduction

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INTRODUCTION

The following document is an analysis of the existing market gap in the field of retrofitting works in the territory of the Municipality of Mantova. The analysis is based on existing data, mostly taken by the 2010 national census and on those collected by the Municipality due to retrofitting works on publicly owned buildings. No new data have been collected, for instance through surveys, interviews, focus groups, etc. As a result, data are relative mostly to public buildings, leaving a quite substantial research question open on private residential buildings. The paper shows that the city of Mantova is divided into two areas: one characterised by buildings older than 1945, mostly rented and bond by UNESCO for their historical values, on which any kind of works is forbidden and with a more external areas of buildings built between the 50's and the 70's, owned for a large majority yet by slightly less well to do owners. This situation, combined with national incentives and subsidies that do not take into account local dynamics and socio-economic geography and that are mostly based on tax refund, makes retrofitting works not very appealing. However, given the lack of extensive and in depth hard data, the paper argues that the most important step is to take action to gather updated data to have a clearer understanding of the situation. Project Innovate is the perfect medium to do so and to start some pilot actions that later can be extended to a larger area of Mantova's population.

STEP 1: THE TOPIC

The main topic of the analysis depicts the state of the art of energy savings works and opportunities in the Municipality of Mantova. The paper introduces the characteristics of Mantova's residential buildings (including their energy classification), the expertise gained by the Municipality's staff of energy saving interventions and retrofitting works, a list of local stakeholders (or lack of) that operate in the field and their relations (or lack of) with the Public Administration, a summary of the national incentives and subsidies and how they work. The aim of the paper is to put together the pieces and compose the puzzle to answer the question of how to improve the quantity and quality of retrofitting works in the city of Mantova, thereby increasing the general quality of the buildings themselves as well as the inhabitants quality of life.



STEP 2: THE CURRENT STATE

Until 2010 the Municipality of Mantova had established no specific energy policies to improve the energy consumption nor for public buildings nor for private ones. From June 2010, the Public Administration has begun to work on an energy plan that was finally approved one year later, in 2011. However, Mantova Municipality's energy plan only involves public buildings, for which we have now several data available: energy efficiency certification, a "commented" reading of energy bills, a plan of retrofitting works and especially an extended connection with the local district heating network. From 2017, within the PAES framework, the Public Administration has begun to work with private sector as well, although only for some data collection and meetings with some condominium managers.

As of today, we know that the private sector is thus characterised: 60% of homes are made up of condominiums (according to the 2011 census), which amounts to 2.537 homes. Most of the residential buildings were built before 1945 (36%) and in between 1945 and 1969 (36%). Thus, very little is new and already built complying to the most recent regional and national laws on energy efficiency. To make things worse, almost half of the oldest homes have an historical value and are then somehow bond from national laws enforced by the local superintendent of fine arts.

The above situation leads us to the decision of selecting a condominium built between 1945 and 1969 and that is located outside the area of the old city-centre, which is protected by some strict regulations imposed by UNESCO. This will allow homeowners to tackle the issue of energy efficiency with more instruments and tools, in shorter time and with less costs. These condominiums in fact, share with the older one located under the UNESCO umbrella, the same energy class, that is E, F and G. Moreover, differently from the ones in the city centre, 70% of them are lived in by the owner itself, whereas in town the owner lets out his/her nicely decorated, historical flat and lives in the outskirts. That represent a crucial factor in undertaking expenses to improve the comfort of your living, while on the other hand, it is less effective to spend money without direct benefits but only on the more abstract value of the home itself.

The real challenge that this segment of the market will pose to the final objective of the project is represented by the general characteristics of the home-owners. In fact, the large majority is composed by retired people, in between 60 and 90 years of age, in many cases living alone, that find little benefit in mid/long term financial schemes. On the other hand, because of systemic conditions, Mantova lacks a whole generation between 20 and 30 years of age and those in their 30's and 40's tend to purchase their first home outside the Municipality's territory, where buildings are newer and cheaper. Short distances between the city and its suburbs favour this kind of behaviour.



This consideration leads us to the financing schemes and subsidies available to homeowners. In Italy national subsidies for retrofitting works are now being revised, because in the last years they have proved not extremely appealing, for several reasons. It takes no less than 10 years to get back the money one private homeowner may want to invest in retrofitting works for its place. For an elderly individual or couple, in their 60's or 70's, the prospect of spending now their savings to have them back when they are 70 or even 80 may not feel as the most sound investment. Moreover, subsidies cover up to 75% (albeit only in a few specific cases) of the money invested, meaning that homeowners must enjoy some sort of liquidity anyhow, at the moment of the works being done. This caveat combines with other two requirements that are very restricting of the potential audience of beneficiaries. On the one hand, the subsidies are capped to a maximum tax refund of 100.000 Euros; on the other, eligible beneficiaries are only those with an already very low household yearly income and cannot therefore afford even the smallest investment. In fact, it must be remembered that all the subsidies discussed are envisaged as tax refunds: in other words, homeowners must pay all the due costs upfront and they will then reimbursed at a later stage.

In short, the current state of the art shows the following. Energy efficiency conditions of private buildings in the territory of the Municipality of Mantova have never been studied thoroughly. As a result, the most immediate need is to launch a great data collection, much needed for both owners and public administration. Secondly, the city of Mantova is essentially split into two well different zones: the inner old centre of the town, where buildings are older than 1945, population is fairly richer, older and mostly rent, where UNESCO strict limitations loom on any retrofitting working will; the immediate suburbs, with buildings mostly from in between 1945 and 1969, with a population of mostly homeowners, slightly younger and poorer than the rest and with no law limitations on retrofitting works. Both zones have though in common the current energy efficiency class: mainly from E to G, with a better situation in the suburbs. Subsidies turn out have not dramatically changed the situation for the better: mainly because they are envisaged as tax refund (as oppose to down payment), in long-term (10 years), that do not cover the whole amount of money invested (but only up 75%) with a cap to 100.000 Euros. Finally, the low household income requested to access the subsidies is the final disincentive to already not so much appealing schemes.



2.1 Interpretation of segmentation

Our interpretation of the current state cannot be but partial. In fact, any sound analysis on the state of the art is undermined by the lack of consistent hard data. Thus, the first action to undertake would be a big investment in local surveys, capacity building meetings, etc. in order to increase the knowledge about all aspects involved in the decision-making process that leads homeowners to undertake retrofitting works.

Having said that, on the basis of the partial data in our possession, some conclusions we can draw. As far as the UNESCO protected city centre is concerned, lack of data is a relatively small problem: in fact, national legislation is overtaken by international legislation and therefore no interventions are allowed, regardless of how good are financial incentives, how bad is the buildings situation, how rich/poor are the households involved, etc.

The rest of the city represents instead a more interesting scenario. A thorough work of capacity building conducted by the Public Administration, together with partners from the financial/banking and the building sector in particular, could lead to the creation of way more appealing schemes than the existing ones. In fact, some tailor-made package of services could meet needs as diverse as the population living in this area of Mantova. Elderly would certainly more eager to invest in retrofitting works if it takes less than the actual 10 years to have back the invested sum; on the other hand, young people could endure longer investing terms, yet with a higher contribution than the actual 65% capped at 40 and 100.000 Euros, depending on the kind of work. Currently though, we are not in the position of knowing exactly how different segments of population would react given that, as mentioned earlier, no studies have been conducted prior to this project.

STEP 3: IDENTIFY THE MARKET FAILURE: THE GAP

On the basis of the little data available, it is certainly a difficult task to identify sound drivers and barriers. However, given the Municipality's previous experience with public buildings, in light of some other local projects in Italy (for instance Padova and Parma) and regional and national trends, we can advance some reasonably likely working hypothesis.



Mantova is no exception in struggling through the more general financial and economic crisis that is hitting Italy. Moreover, despite sitting in the richer and relatively better to do North, Mantova is being suffering the economic crisis almost as much as if it were a Southern Italian city. To mention only a couple of examples: in 2014 Mantova was the 3rd city in Italy with the highest ratio of abroad emigration of young adults, only after Trento and Bolzano (which though being the only two native German provinces in Italy have a natural emigration towards Austria and Germany) and was the only province from Northern Italy in the top 10 for numbers of small and medium enterprises shutting down within the first 12 months after their birth . All this to say that saving money represents the most important driver also when speaking of retrofitting works. Therefore, the focus should be on national incentives and subsidies (there are no local ones), as described in the previous section.

Minor drivers do exist, although we are not able to quantify them. For instance, the city of Mantova hosts a large number of national and local environmentalist associations and grassroots movements, which are in turn supported by the local government (municipalities and the province). As a result, both in local government and especially in some segment of the population, there is a good sensitivity towards environmental issues, including energy saving. However, up to day organised groups promoting energy saving behaviours, retrofitting works and so on, do not act in a systemic way. On other hand, the Municipality of Mantova has undertaken a campaign to replace with energy saving bulbs all the public lights in town. This process, begun in 2016, is currently ongoing.

As far as barriers are concerned, these certainly outnumber drivers. Financial incentives and subsidies, are at the same time drivers and barriers. As explained above they work as tax refund according to the following scheme:

● general retrofitting works	65%	cap €100.000
● window glass and frame	65%	cap €60.000
● insulation	65%	cap €60.000
● solar panels	65%	cap €60.000
● solar shades	65%	cap €30.000
● boilers	65%	cap €30.000
● biomass boilers	65%	cap €30.000
● heat pump	65%	cap €30.000
● building automation	65%	no cap
● condo common areas	70/75%	cap €40.000

Other barriers exist and may be defined minor when compared to the financial aspects. Although, they are so many more in numbers that, in the end, their sum might be even more crucial in the homeowners decision-making process. For instance, the high density of historically valuable buildings is probably the most important barrier as far as the city centre is concerned. The lack of



specific incentives for these buildings and, especially, the lack of coordination between national and international legislation hinders any will for retrofitting works.

The total absence of tailor-made service, that can answer the different technical, financial and administrative needs each individual household may have, does not contribute to instill a sense of security in investing in energy saving works.

Where retrofitting works would be most useful, that is in condominiums composed of many units, it is sometimes very difficult to convince all the different owners to undertake new works. Some might be too old for a 10 year long investment; some might not have money enough; some owners do not live in that property; etc.

An open question remains though as to why in a country of homeowners so few undertake energy saving works. In fact, if one lives in his/her own property, it would mean to save a lot of money; if one lets the property out, it could recover the investment by increasing the rent. Once again, the first utmost necessity it is to conduct a more thorough investigation through surveys and questionnaires, to help answer these questions.

3.1 Interpretation of barriers and drivers

As the previous sections shows, barriers are different depending on the area of town considered and depending on different kinds of households. On the other hand, the major driver appears most of the time to be financial.

Therefore, it is our interpretation that regarding barriers, it is necessary to develop tools and services that are tailor made on the customers involved. In fact, even a small city like Mantova presents a diversity of cases that makes impossible to adopt a unified strategy to promote retrofitting works in the whole town. Mantova's case might prove as well a realistic explanation as to why national subsidies and incentives struggle to convince homeowners to undertake energy saving works: if such a small reality like Mantova is yet so diverse, how can one set of incentives apply to such a diverse country like Italy, that spans from the rich Alpine regions in the North, to the less well to do Mediterranean coast in the South?

Having financial benefits as main driver, thus we reckon fundamental to build from the outset constructive and sound relations with financial institutions and banks. To come up with efficient and appealing financial schemes seems to be the utmost necessity and top priority to incentivise people to start retrofitting works. Other minor drivers mentioned above may certainly be fed and utilised, although they seem to remain marginal in homeowners decision-making process.



STEP 4: HOW THE GAP SHOULD BE FILLED

We believe there are several important steps to take in order to fill this gap. Given the lack of work done before on this subject, the process looks long and difficult. However, below the steps we suggest to undertake:

- To begin a thorough analysis and data collection to have a more detailed and up to date idea of the situation concerning energy consumption in private residential buildings. Actors to involve in this process are many: homeowners, association of condominium managers, association of engineers and architects, local ESCO, energy companies and public administration;
- To create an energy agency that can crunch all these data and work closely both with public administration and private companies to design and promote energy saving actions and campaigns for private individuals and companies;
- To begin a participatory process led by the Municipality that involves all the relevant stakeholders: for instance, the Superintendence for Fine Arts and the local Landscape Commission for what concerns the city centre under UNESCO restriction; local banks and financial institutions to design financial schemes that are tailor-made on the needs of local residents; involve the local ESCO, professional orders, condominium managers association into promotional and advocacy campaigns; involve schools into educational actions; etc.

4.1 Interpretation of the gap filled

Certainly, some of these steps will produce sub-barriers which will slow the process. Also, there are some bigger dynamic, such as the economic crisis and the credit crunch, which are variables we cannot control and have to adjust to. However, fixing at least the points made above, will for sure lead to the creation of a more efficient and, in general, better working structure that can create a virtuous system as soon as bigger dynamics return more favorable.

This is to say that, being the problem mostly related to money, it is unlikely to be solved by creating a network of actors and stakeholders that together work systematically and with the same objective, unless some of them are eager to give up to some of their income.



Though, an increased knowledge about the state of the art, an increased level of trust between citizens howe-owners, public institutions and administrations and private companies, can create the right ecosystem ready to kick off as soon as economic data improve.

4.2 Actors mapping

Refer to spreadsheet for data.

4.3 Interpretation of the actors mapping

Mantova shows a good social fabric when it comes to associations: citizens, architects, engineers, homeowners and tenants, building companies and condo managers, many different social categories are organised in groups. That might represent a plus for the project for several reasons: working with organised groups of individual rather than with individuals ease the decision-make process, it establishes more institutional and recognisable relations, it can rely on pre-existing relations, etc.

What Mantova seems to be short of is private partners. At the moment of writing in fact, a part from the Municipality's subsidiaries TEA and ASTER, working respectively on energy and housing amongst the other things, it appears more difficult to identify other private companies immediately ready and eager to embark on the project. A similar situation can be described regarding banks and financial institutions. Currently, talks are ongoing with two banks, a local and a national one, which have shown some interest in the project.

4.4 Services mapping

Refer to spreadsheet for data.

4.5 Interpretation of the services mapping

As the map shows, not many services are offered for retrofitting works in Mantova. The main asset is certainly Italy's second largest district heating grid, which that alone can curb one building emissions of around 40%, once installed. This service is managed by TEA (the Municipality's subsidiary) that though does not offer other specific services regarding energy efficiency. At first talks, they have expressed their interest in exploring the opportunity to extend their business to other aspects of energy efficiency. We are currently deepening the subject with them.



As far as all the other services mentioned in the spreadsheet are concerned, Mantova's case appears lacking the majority of them. It seems necessary a far greater involvement of private business, of citizens as well as of local and regional public administrations.

STEP 5: GENERAL CONCLUSIONS

The analysis carried out in this document allows us to draw some general as well as some more detailed conclusions on how to design the future works.

As step 1, we will identify one pilot condominium and begin to build some mutual trust and constructive relations with the resident homeowners. The condominium manager will conduct a crucial facilitation work in order to arrange and conduct meeting between the Public Administration and the other stakeholders involved.

Step 2 entails talks with the local energy provider company, TEA, that can offer a dramatic increase in private residential homes energy savings by bringing district heating. TEA, the most used energy provider company in town, can also be crucial in supporting the project through their regular communication campaigns.

Step 3, probably the most complicated, is to organise and hold talks with local (preferably) and national banks to involve them in the project. The ideal outcome would be to convince them to co-design financial tools tailor-made on the needs of the home-owners identified with the pilot condominium.

Professional orders, engineers, architects and geometri, will be contacted and hopefully involved in the project as of step 4. In fact, those of them specialised in retrofitting works, work closely with homeowners, enjoy their trust and thus can have their ear when it comes to counselling. They can also represent a crucial actor in building trust and confidence in the project working groups and other stakeholders and actors involved.

Step 5 consists in involving in the project the local association of builders, which are naturally connected to the professionals mentioned above, and represent the last yet fundamental component to guarantee the implementation of the project outcomes.



In light of this roadmap, we can assert some confidence regarding all but step 3. Despite we can already enjoy some availability from one local and one national bank, without some loosening on the credit crunch, we foresee difficulties in implementing further energy saving works. On the other hand, participation of local energy provider company, TEA, can be crucial: in fact, through the extension of their district heating grid, they can increase dramatically the energy efficiency of a building with one-off intervention. Working with them on tariffs and possible incentives on other improvements related to gas supply (such as boilers for instance), represent the natural evolution of the work done thus far.

TEA's contribution, alongside those of professional associations and condominium managers, will be helpful also to communicate and disseminate the project activities and outcomes. Thanks to their regular communication campaigns and to the meeting the professional associations hold, it will be easier to spread and increase knowledge about the project.

Professionals and condo managers will also have the crucial role as project ambassadors to homeowners. Their role in advocating retrofitting works and building confidence in all the actors involved and trust in the project.

During the whole length of the project, it will be necessary to collect all data available, to integrate them with the existing ones, so to enlarge, enrich and update the current database.

STEP 6: CHECK YOUR ACTION

6.1 SWOT analysis

Refer to spreadsheet for data.

6.2 Strong points

The strongest point is certainly represented by the Municipality's staff expertise and experience gained in the field of energy saving. In particular, the Municipality has been working for years now on strategic, long-term plan for energy efficiency, undertaking not only retrofitting works but also other measures that could help a general decrease of energy consumption.



This activity has helped to build a mutually fruitful relations with many professionals and experts, as well as with their associations and specialised working groups. Good relations have also been established with some condo managers and with their association. This also represents a strength of Mantova's situation.

To extend TEA and ASTER's, the two municipal subsidiaries, core business to energy efficiency in private housing represent an opportunity to explore further. Their connection to the Municipality is strong and to some extent they share with the Public Administration some of their job targets. Their role is potentially crucial in successfully developing the project.

Another opportunity is to establish a new subject of talks with the local Superintendence of Fine Arts, based on the good work the project has proved it can be done on private housing in outside the UNESCO protected area. This point can probably be better defined as an outcome of the project; yet it could disclose infinite opportunities to make Mantova's city centre a way more efficient (and less polluted) place.

6.3 Weak points

The first strength mentioned above represents a weakness as well. In fact, the Municipality's staff has never applied their expertise and experience on private buildings. Given the similarity in terms of the buildings type, there's room for hope that it won't have to be a big adjustment for them.

Institutional relations with private companies does not help in convincing them to take part in a project that works on an economic field currently in deep crisis. Especially if the public sector does not foresee to introduce new incentives, or to improve the existing ones.

Same situation applies to banks, with whom the Municipality has almost no relations whatsoever.

Potentially weak points are also, the very little successful experience carried out by the Municipality of involving citizens in project of this nature and the constantly overworked staff.

The biggest concern though, that could turn out to be the biggest threat to the successful outcome of the project, is the general citizens skepticism towards retrofitting works and energy efficiency measures in general. We have already deepen the motives in the previous sections, so it will suffice here to say that citizens participation will have to be stimulated with more appealing tools than those used up to now.

Finally, thus far only one local bank around the area of Milan (160 Km from Mantova), has developed some sort of financial instruments dedicated to retrofitting works and that work to



make the most of the existing incentives created by the national government. That foresees a lot of work to make another local bank in Mantova (let alone a national one) to do the same.

6.4 SWOT conclusions

In short, Mantova can enjoy of several strengths, mostly related to the expertise of the Municipality staff and their experience in working on energy saving measures, yet on public buildings. The municipal subsidiaries companies represents external opportunities that can eventually turn out to be crucial for the positive outcome of the project.

On the other hand, the deep and long financial crisis that has hit Italy, and in particular the building and renovation sector, has distanced citizens from undertaking such works. Probably as a consequence, national and local banks have not developed specific financial tools and therefore already not so appealing subsidies are not exploited in full.