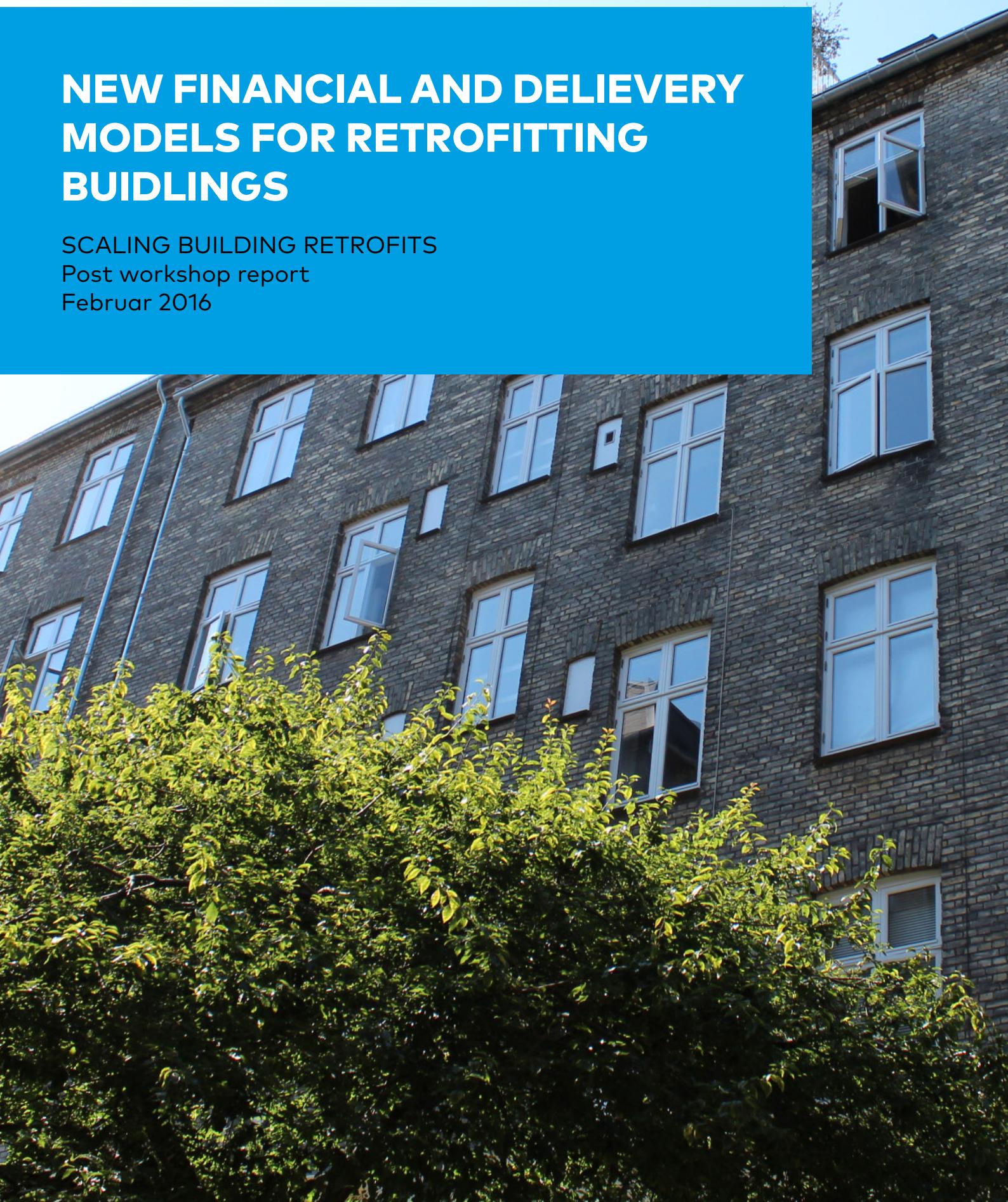


NEW FINANCIAL AND DELIVERY MODELS FOR RETROFITTING BUILDINGS

SCALING BUILDING RETROFITS

Post workshop report

Februar 2016



INDHOLDSFORTEGNELSE

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<http://usdn.org/public/page/13/CNCA>

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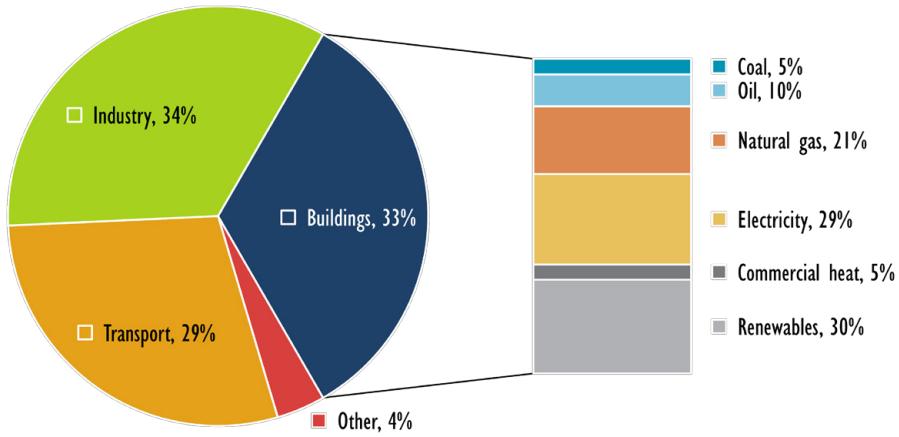
FOREWORD

Reducing the level of energy consumption in the existing building stock has proved to be a major challenge for cities striving to become carbon neutral. Identifying new ways to retrofit these buildings to reduce their energy demand and supply them with more low-carbon fuels is essential for cities if they are to succeed in reaching their targets of reduced CO2 emissions and energy consumption. The building sector is by far the largest consuming sector of energy.

Although new buildings designed to be much more energy efficient and to use low-carbon fuels will ensure a decrease of CO2 emissions, we are still facing the risk of a growing energy consumption in the existing building stock.

Based on the evident low market up-take of the current financial models available for new retrofits and energy efficiency improvements, it is safe to say that the problem is growing in size and importance. The amount of capital needed to retrofit existing homes calls for a mobilization of private finance. Existing examinations of the main causes of low market activity in this area identify limited financing options as one of the main obstacles, in particular the initial capital injection required can be quite burdensome on a balance sheet. There is a need for the development of different financial incentives and innovative delivery models. Lack of knowledge and the absence of track records of accomplishment and experience are other significant elements in the field of energy investments which increase the perceived risks and contribute to high transaction costs.

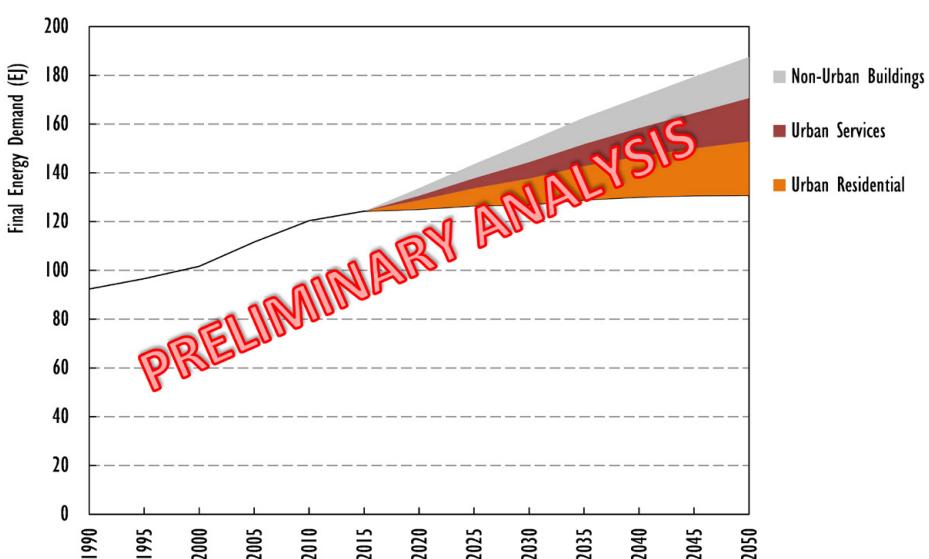
The market for retrofits and energy investments appears undeveloped despite the huge needs which in principle should be attractive for many different investors. Some argue that we have reached a point where data on retrofit and financial schemes seem to be all that we have, yet much of it is not aggregated on an international scale due to different standards in measurements and data collection procedures. To mobilize capital and awaken a market that is fast asleep, governments have a key role to play in ensuring that attractive investment opportunities are available to private investors and effective instruments for project planning and assessment supports building owners in their retrofits. But what does it take to make building owners and tenants ask for a house refurbishment in the first place? From this point of view, financing can be said to be the last step in a chain of events.



Source: Source: IEA Key World Energy Statistics, 2015

A substantial upscaling of the market for provision of finance to deep retrofits requires the establishment of a retrofit market that attracts both public and private capital from a flow of transparent and standardized material available to everyone interested. Furthermore, the market will need to be matured from a demand-driven development and where new partnership formations are able to convene and connect different professionals. In this sense, we find ourselves in a situation where we have a lot of preparation to do for getting the market of existing buildings ready for retrofits.

This report examines the current state of affairs in the field of deep retrofit and energy efficiency investments for the existing building stock. It is based on a workshop held in Copenhagen in the fall of 2015, where leading cities and experts examined existing barriers and potential solutions for mobilization of finance for investments in energy efficiency and deep building retrofits.



Source: IEA ETP 2016 (forthcoming)

The IEA predicts that urban areas will account for some 85 percent of expected buildings energy growth to 2050 and more than 70 percent of buildings energy savings in the 2 DS (IEA ETP 2016 forthcoming). These predictions means that cities are essential key players to develop and achieve ambitious energy renovation strategies and capacity building in the public sector. That is why this report is specifically focused on the future role of cities as authorities, facilitators and building owners, and the need for different approaches to stimulate demand and the use of strategic partnerships as a way to establish new funding options.

INTRODUCTION TO THE CNCA INNOVATION FUND

The Carbon Neutral Cities Alliance (CNCA) is a new collaboration of international cities committed to achieving aggressive long-term carbon reduction goals. The Alliance aims to address what it will take for leading cities to achieve these deep emissions reductions, and how they can work together to meet their respective goals more efficiently and effectively.

Cities striving for carbon neutrality recognize that averting the worst impacts of climate change will require cutting GHG emissions by at least 80% by 2050. Because urban areas account for nearly three-quarters of human emissions, reaching this goal will depend in large part on our ability to reimagine and reinvent cities in ways that promote economic prosperity, social equity, enhanced quality of life, and climate resilience.

Funded by the first round of projects supported by the CNCA Innovation Fund, this report is part of the project called 'New Financial and Delivery Models for Retrofitting Buildings', which includes both a workshop and a case study. This report is divided into two main sections:

- A workshop, held in Copenhagen 6-7 October 2015 on 'Scaling Building Retrofits' which discussed existing barriers to increasing the amount of retrofits. Prior to the workshop, a building stock baseline for the participating CNCA cities was established, depicting their usage and knowledge of different financial schemes and programs, some of which will be used in this report. The workshop further introduced the concept of Energiesprong and presented a preliminary analysis of the flexibility of the concept.
- A full case study of the Dutch Energiesprong project, which investigates the possibility of replicating the model on other building types and tenures, along with its cross-country potential based on three archetypal cities.

The workshop was organized by the City of Copenhagen in collaboration with the non-profit partner organization Gate 21, and the case study was undertaken by the City of London.

1. Workshop: Scaling Building Retrofits

On 6 and 7 October 2015, leading cities and experts from all over the world met in Copenhagen to discuss new financial and delivery models for retrofitting buildings. Barriers and challenges related to current best practice, and mature and emergent financial schemes were explored in group sessions, resulting in an identification of core barriers and potential areas of improvements. Discussions took place from different actor viewpoint. However, the aim of this report is to delineate and specify the future role of the city, and its interaction with other groups of actors in the market for building retrofits. The following part of the report presents a collection of ideas, personal insights, and experience provided by representatives from:



The cities of New York, San Francisco, Vancouver, Santa Monica, Portland, Oslo, London and Copenhagen, as well as representatives from the Carbon Neutral Cities Alliance (CNCA) and C40, experts from the Investor Confidence Project, the International Energy Agency, the European Bank of Reconstruction and Development, the European Commission, Econoler, and the Climate Bonds Initiative.

1.1. Barriers and challenges

Reducing the level of CO₂ emissions originating from the existing building stock is a major concern for cities all over the world, which requires major energy efficiency improvements and deep retrofits of the existing building stock. These improvements and retrofits are costly and can be quite complicated to deal with and their expected outcome is often difficult to predict. Schemes and governmental programs have been developed throughout the years to meet financial needs and establish models of operations, but the market for retrofits is still plagued by information asymmetries and misconceptions of the technical risks and financial benefits of increased energy efficiency.

Prior to the workshop CNCA the cities submitted data regarding their familiarity with and usage of certain financial models and instruments. The following figure presents the answers

from the cities. The actual usage of the different schemes differs substantially from city to city, where changes in national regulations is known to have an influence on a city's ability to use certain schemes.

It should be noticed that none of the schemes were used by all cities. In fact, experiences from the workshop indicated an element of difficulty in getting building owners to adopt these different types of schemes. Even governmental grants had been experienced as difficult to 'give away' to interested building owners. Some cities had even experienced a troubling low demand for retrofits even when the grant came to almost 80 percent coverage.

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
Citizens'/ users' own finance	London	London	London	Oslo	London	London
	Oslo	Oslo	Oslo	New York	Oslo	Oslo
	Copenhagen	Copenhagen	Copenhagen	Vancouver	New York	Copenhagen
	New York	New York	New York		San Francisco	New York
	San Francisco	San Francisco	Santa Monica		Portland	San Francisco
	Santa Monica	Portland	Vancouver		Santa Monica	Portland
	Vancouver	Santa Monica			Vancouver	Santa Monica
		Vancouver				Vancouver

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
Subordinated Loans	Oslo	Oslo	Portland		Oslo	Oslo San Francisco

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
Covered Bonds	London Portland	Portland	New York San Francisco Santa Monica	New York		

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
Leasing	New York Portland Santa Monica	New York Portland San Francisco Santa Monica	London New York Portland	New York Portland	New York Portland Santa Monica	New York San Francisco Portland Santa Monica

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
On-Bill Repayment	New York San Francisco Santa Monica	New York Portland San Francisco Santa Monica			London New York	New York San Francisco Portland

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
On-Tax Finance		Portland San Francisco Santa Monica		London	Oslo	Oslo Copenhagen London San Francisco

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
Energy Performance Contracting	Oslo New York	Oslo London Copenhagen New York Portland Santa Monica	Copenhagen New York Portland San Francisco Vancouver	New York Portland San Francisco Vancouver	New York	Copenhagen New York

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
Public ESCOs for Retrofitting Public Buildings	New York	New York	Copenhagen London New York Portland San Francisco Vancouver	New York San Francisco Vancouver	New York	New York

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
Public ESCOs for Retrofitting Private Homes	New York	New York	New York	New York San Francisco	New York	New York

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
Green Bonds		San Francisco	San Francisco Portland (Oslo)			

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
Energy Service Agreement	Oslo Copenhagen New York	Oslo Copenhagen New York Portland San Francisco	Copenhagen New York San Francisco Portland	Copenhagen New York San Francisco Portland	Copenhagen New York	Copenhagen New York San Francisco

	Commercial rental	Commercial	Public	Public rental	Private rental	Private owners
Energy Efficiency Investment Funds	Oslo	Oslo	Oslo London	Oslo	Oslo	Oslo San Francisco

ESCOs and EPCs have been somewhat successful throughout the years in both residential and commercial buildings across different countries, but they tend to pick the low-hanging fruits (lightings, thermostats etc.) and have proved limited as a financial tool. Recent programs like Property Assessed Clean Energy (PACE), which has shown some promise in its way of disconnecting the debt of the building owner undertaking the retrofit and attaching it to the building itself, have not yet presented any large market uptake, and Green Bonds are still just emerging as a 'new city tool'. To get the investment vehicles moving and market liquidity flowing, retrofit investments must be up-scaled and include cash-flows from both private markets and investments projects from public offices.

The requirements for improving the conditions for a strong retrofit market have previously been outlined as a common need for more technological developments and new innovative financial schemes that have the potential to reach a fast market maturity. However, it seems that we have reached a point where we have to start making it less complicated and perhaps even less innovative but more effective. Perhaps we have to start asking investors what makes them reject proposals in the first place, and which risks they associate with retrofit investments and their transaction costs.

Additionally, previous examples have shown that there are many non-financial barriers to consider as well a cultural dimension when undertaking a retrofit. Drawing upon experience from the selling-point economy, the market for retrofits and energy efficiency improvements is facing a genuine lack of experience with selling retrofits as a consumer good. What are we actually offering building owners when we propose a comprehensive retrofit? Uncertainties regarding market demand for retrofit financing combined with a low share of allocated marketing tools or budgets earmarked to handle such demand activities, influences the market readiness for funds and investments of retrofitted buildings. So how do we get people to strive for carbon neutrality and how do we make it more appealing to investors?

The discussion essentially ends in a chicken and egg dilemma. Nobody wants the money, yet buildings owners cannot find it when they need it. There is a lot of capital available, but there are also many uncertainties.

Within the market for energy efficiency and deep retrofits, many project development activities are currently being developed, however, most of these are relatively small-sized and some are even in the very low end of the TRL scale for new project development. Small-scale projects



do not attract investors at first hand, who initially seek out few but large projects, in order for them to manage risks. In this way, small-scale projects are needed as small parts of a larger puzzle, that we are still to assemble in an effective manner. This requires a much more nuanced picture of retrofitting buildings than the one single building owners, financial experts or other relevant stakeholders possess by themselves today.

There is a role for cities in strengthening the market for retrofits. Proper demand-based retrofit projects have to be developed into good project proposals in a bankable deal which is able to attract available capital. New strategies are needed to secure a sufficient level of finance for retrofits in the existing building stock and they should be based on a combined effort from public and private stakeholders.

1.2. Areas of improvement

The current lack of scale and unclarified demand present a great risk for cities in reaching their climate targets and developing urban planning activities. Besides providing clear and consistent environmental policies, along with enforcing existing EU legislation, cities have a role to play in facilitating a sustainable strengthening the retrofit market. The following section will focus on specific areas that deserve attention with a special emphasis on the use of strategic partnerships.

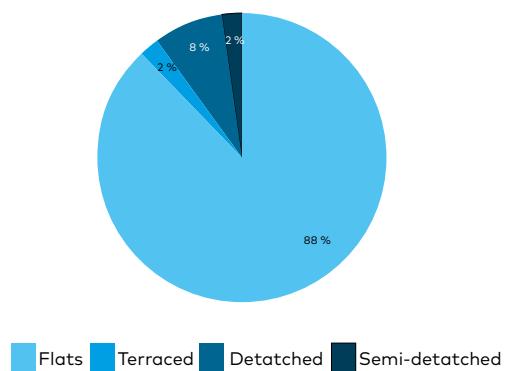
1.2.1. Identifying and creating demand

Demanding energy efficiency improvements or even a deep house retrofits can be brought on for a number of different reasons. However, it is not always easy to identify drivers behind the initial investment decision. In order to strengthen the demand for building retrofits, improvements must not only attract the building owner but also be presentable as attractive investment opportunities for financial institutions.

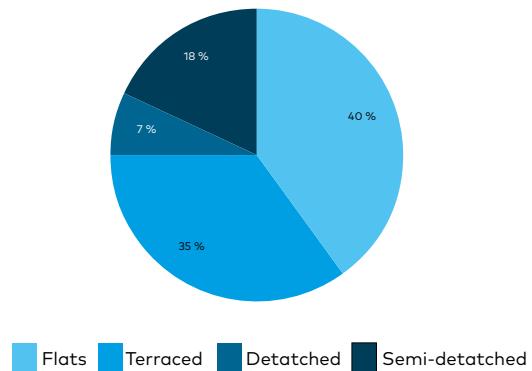
When it comes to demand from building owners, important factors shaping the demand are tenure status and building type, such as commercial versus non-commercial floor space, privately held (owned or rented), social housing, public buildings and so forth. There is a fundamental difference in the approach to retrofitting the building stock for each city because of the large difference in the building type and tenue. The type of building and tenure matters a great deal, because the ability to regulate the different groups differs from city to city. There is a limited mandate or a so-called stick to force regulations on private building owners. Legal enforcement in the property and residential sector varies from city to city, where some can benefit from the ability to put forward local rules and demand. For other cities, private market regulations can limit the options available to cities, such as requiring building data disclosure, or even propose that buildings with an energy label below F and G cannot be lead after 2020. This can only be upheld in some cities, who has that legislative ability. Energy audits commissioning only requires you to look at the buildings but not to do more. There is no governmental push to scale up initiatives.

Each city has a diverse set of buildings types and building owners with different motivations for retrofitting their buildings. The identification of stakeholders and building owners based on building types is needed for the identification of demand-drivers and actions which are needed to increase market volume of deep retrofits. The figures below display the difference in the residential existing building stock between Copenhagen and London.

COPENHAGEN



LONDON



Cities can use this type of insights to identify different categories of building owners. The private building owners or renters have proved to be the most difficult group of home-owners to influence, due to the split incentives problem for rentals and the lack of demand from privately held buildings that requires a lot of upfront costs often funded by an increase of mortgage debt. This segment of building owners have been seen to be bound by a broad range of psychological factors, influencing their choice of renovations in their home, and where an irrational consumer behavior can be seen.

As opposed to building owners with commercial floor space, who potentially see a business case to a retrofit, the private building owner (or renter) might have different reasons to undertake a retrofit. The desire to improve a home is very human and centers around design, aesthetics, and culture. For consumers a retrofit might as well equal a home improvement.

The lack of market uptake based on existing explanations of energy related value propositions from retrofits points towards a limited exploration of different emotional trigger points and motivations of undertaking a retrofit. It is crucial that cities start mapping the different consumer segments and work towards identifying the right trigger points for each segment. A renovation is a decision that relies on trigger points, which is not necessarily energy related.

Even though this report will argue for the simplicity of current practices, paving the way for standardizations, cities should recognize the opportunity of stimulating demand stemming from other considerations than the need to mitigate global warming and conserve energy. This requires a much broader view on demand for building retrofits. Using the selling-point economy as guidance for progress and development, cities could explore climate-related areas such as earthquake and water-security as new possible 'product combinations' for a retrofit offer or project plan.

There is a need for progress on identifying attractive qualities, such as improved indoor climate, that can be used with the sale of a retrofit to a building owner. Marketing and communication is both very important in this development process. There is a clear need for more compelling selling points based on emotional trigger points for regular households, and business models relying on oil and energy prices have proved to cover only a fraction of demand.

"We need to make people care. No one wakes up in the morning and thinks, 'hey, I want to retrofit my house today'. We talk about cost effectiveness but humans are irrational and they buy a lot of things without positive return on investment. They buy things that make them happy in some way or the other. We need to make people just as excited about retrofits as new countertops"

(Steve Fawkes, Investor Confidence Project)

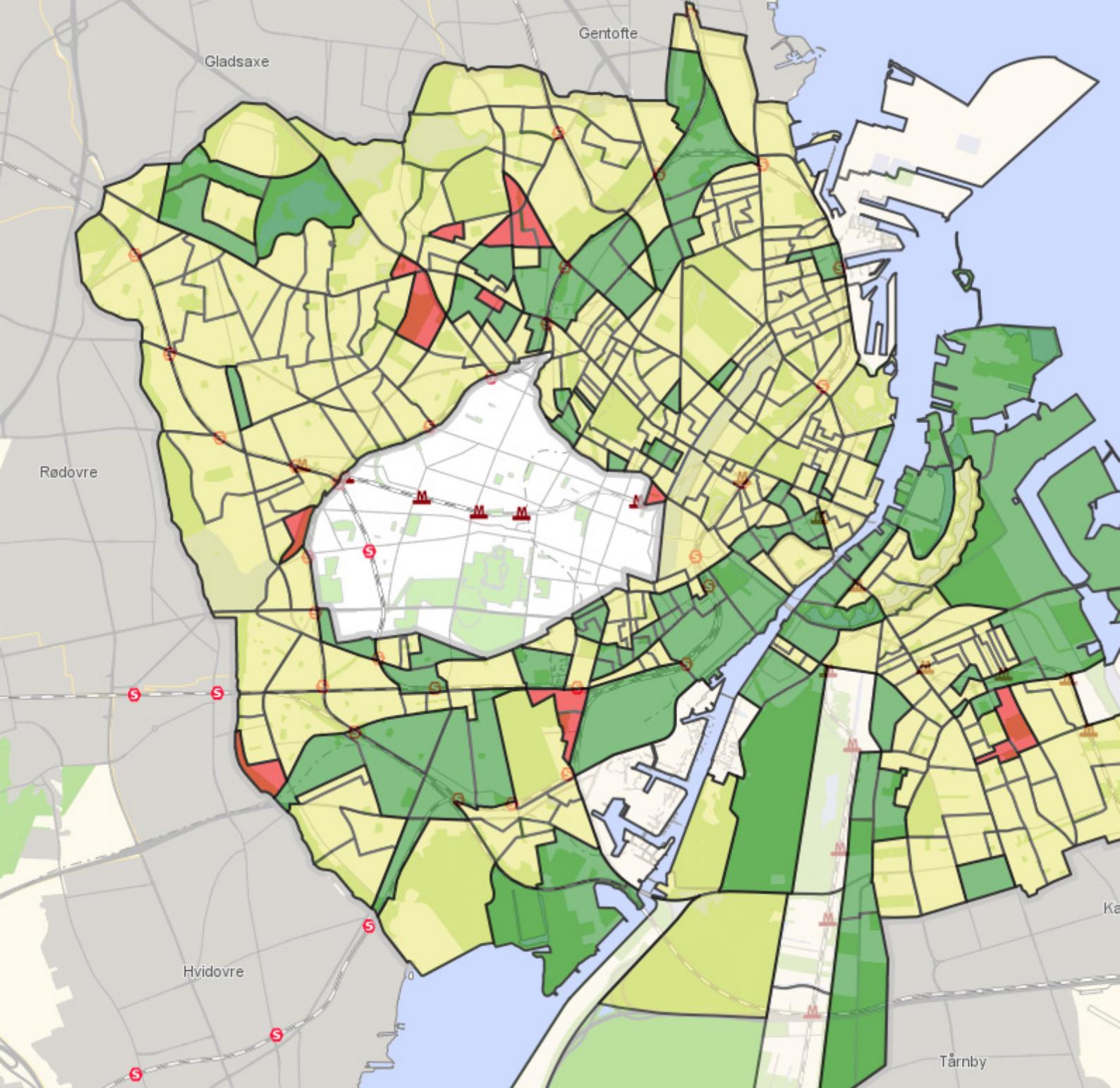
A key learning point when it comes to housing is that people generally tend to not care, and the purchase is a gut feeling instead. In the end, purchases rely on emotional trigger points. The majority of people care about aesthetics, but cannot see many of the energy efficient improvements, since they are invisible. Benefits such as improved indoor climate, including improvements on air, lights and smells could be introduced to buildings owners as secondary benefits that should be included in a renovation decision.

To summarize, cities can:

- Categorize different building owners and their building type from the existing building stock
- Use different strategies to approach different building owners supported by the identification of different trigger points and selling points that goes beyond a business case based on lower energy bills
- Combine new ways of climate-related elements as new retrofit product combinations



FOTO: Cees van Roeden



Heat consumption in Copenhagen

White: 78-104 kWh/m². Green: 104-130 kWh/m². Yellow: 130-155 kWh/m². Red: 155-185 kWh/m².

The net unit space heating and hot water consumption is illustrated on district level for BBR residential and non-residential building stock in Copenhagen. The values are weighted average consumption in the districts based on the report: "Varmebesparelse ved løbende bygningsrenovering frem til 2050", made by the Danish Building Research Institute, 2013

Sufficient levels of data to operationalize efforts can be secured by engaging and convening people by voluntarily make them hand in data to analyze, which can be used to establish new business cases. Aggregated data, e.g. from utility companies, can provide a great overview of city problems and be used to highlight new areas of potential. At the same time, cities are able to reward large developers and even small newcomers for their collaboration in data collection, with the prospect of getting a public stamp of approval as a trustworthy partner.

Cities needs to find out what data is needed for reporting and explain why such data is needed and why it can benefit private building owners, developers, commercial banks, private investors and other stakeholders to create and share that data. This must be related to their own interest in being able to use the data themselves to get access to more financial options.

To summarize, cities can:

- Encourage data reporting in an open source network assembling
- Identify the need for reporting to aggregate data on a larger scale

Additionally, cities can support the process of demand creation with political instruments, such as a written mayor support-agreement, announcing city support programs or even green project pipelines. If the city has a long-term strategy with coherent development plans, it aids developers and especially commercial banks and private investors to recognize the potentials for investments in a more transparent long-term perspective favoring sustainable solutions.

"Cities can support energy efficiency development by strengthening the financing. The mayor could sign a support agreement which shows that the project is politically supported" (Toivo Miller, EBRD)

Written support or visible city project programs help ensure reliability and stability in the market for green investments, and further have the ability to impact local areas in terms of educating people in energy and behavior, ultimately fulfilling the obligation for cities to lead by example and to continue their efforts. Furthermore, it should be mentioned that there is the potential for cities to realize economies of scale by having the community to act as a collective purchasing body.

Cities could also work on improving the visual translations of achievements in newly renovated public buildings, by incorporating a marketing strategy for each building depending on the public usage. Visualizing improvements in schools, libraries and even office spaces are among some of the tasks that cities could take on. Displaying new signs in particular rooms with e.g. new indoor climate improvements stemming from a retrofit, or fun information pieces written in toilets on e.g. water savings and other functionality improvements all have the potential to reach citizens in the public space. An entrance hall of schools with information on new installations, informing both students and their parents, emphasizes the cities visions and perhaps even future project plans, which highlights predictability in city priorities and emphasizes the overall vision of the city.

Green Bonds

Green Bonds or Climate Bonds have emerged lately from retail, relying on a strong tax benefit and based on a strong return, including better surroundings from the investment in local areas. A city could issue a climate bond against collectables, however, a certain scale is needed. Green bonds opens up for the idea that cities are able to educate through the climate, and provide citizens and investors with a business case that moves away from relying solely on energy incentives but includes local area improvements, securing health, and facilitating green growth employment for future generations.

Further, if the city is to create its own system for collection of payment it would be a risk, unless the city can benefit from the use of an existing collecting system with a proven track record. In this case, green municipality bonds will be less risky, due to existing routines and capacity, e.g. collaborating with utility companies. Successful issues of green city bonds will need further investigation, in order to see what exactly is needed from cities to engage in this.

To summarize, cities could:

- Provide written declarations for market predictability and long-term perspectives
- Include visualization strategies for renovated or retrofitted public buildings
- Investigate the use of Green bonds and green city project pipelines

Case-study collaboration

In terms of adaptability and transferability across cities and countries, cities can do more when collaborating across borders. Peer-to-peer comparisons of materials, case studies and new city programs could be shared to a larger extent than what is currently the case. The creation of shared databases for proven records of accomplishment and more nuanced pictures of the difference in demand in relation to the specific building owner segment could prove very useful for cities to explore further on their own hand. Besides, there is no need for each city to reinvent the wheel for every green city initiative they seek to undertake. Furthermore, there are so much un-aggregated data because cities are measuring differently. A new bridge is needed for more cross-city sharing of data and experiences.

To summarize, cities could:

- Collaborate across cities to build a platform for sharing of case studies and aggregation of data
- Aggregate data nationally and share it across cities on trusted data platforms



FOTO: ADRIAN COWO

1.2.2. Financing bankable project proposals

Retrofits usually require financial support. When looking at the amount of retrofits needed to be undertaken all over the world the potential market size is large enough to interest many different investors. However, in spite of the potential market size, the market for retrofits is immature and inefficient. If the goal is to earmark more capital for retrofit investments, current practices that relate to efficient decision making for retrofit investments must be investigated further. Bringing corporate investors on board requires improvements of current retrofit project proposals, free of any ad hoc processes, leading to transparent project proposals translated into easy understandable bankable products.

Making retrofits bankable products requires both standardization and size. Successful market uptake depends on energy investments reaching a standardization of practice before. To provide the quality assurance that investors seek, both local authorities and private developers have to start thinking of translating the expected energy performance into reliable data that can be risk assessed with standardized schemes and protocols. Standardizations have the ability to convert project proposals into verifiable projects, sorted in e.g. different energy classes, which will reduce transaction costs associated with technical underwriting and increase reliability and consistency of the actual energy savings. The goal is to ensure conformity and compliance.

"You need to make energy efficiency look like everything else, it needs to be completely standardized and it needs to fit into the world of finance"

(Steve Fawkes, Investor Confidence Project)

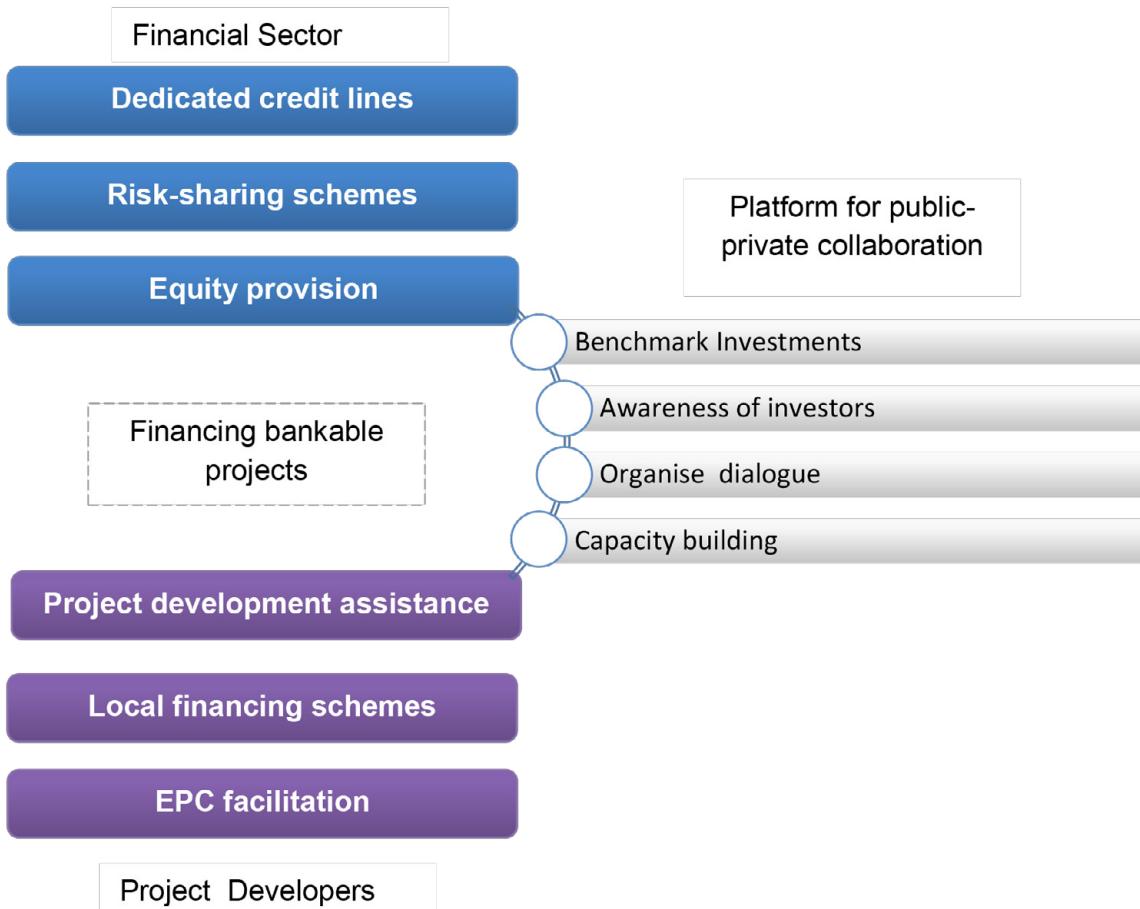
There is a shortage of performance data and proven records of accomplishment and experiences, which turns into a lack of confidence in the expected project output. Without standardizations or transparency there is close to zero predictability in the market, which is a barrier for financial institutions, operating on investment markets that are fairly uniform and predictable. Capacity matters in the sense that supply chain capacity is needed to secure a large number of successful retrofits but many small actors cannot deliver on these terms alone, some of which are further used to installing smaller single-component units – far from an entire retrofit. Finding the right people to take on a retrofit can be a difficult task. A market up-take depends on a removal of these obstacles.

The world does not necessarily know about retrofits and should not be expected to do so. To access key insights and reliable performance data for credit risk assessment standardized data is needed. A project proposal should ideally be presented as a business opportunity with information such as replicability, number of project pipelines, credit lines, how to break them down financially etc. Bringing together different professionals with different experience and skills is needed to scale up the current effort to promote retrofits.

"To obtain finance for an investment, it is not enough to have an idea. The ideas have to be analysed and technically and commercially viable" (Toivo Miller, EBRD)

Public-Private Collaboration

It is often believed that different actors already possess part of the puzzle themselves but have little chance of assembling these to a coherent whole on their own. In order to start aggregating all the pieces of the puzzle that are available new partnerships arrangements are urgently needed. Scaling up means facilitating collaboration in the first place. Cities act as authorities and trusted third parties, and have the potential to provide a neutral ground for decision-making as non-commercial entities.



It is necessary to move away from silo thinking and becoming more experienced in conducting multi-actor collaborations, where different sets of experts can bring their knowledge and experience to the table in order to arrive at accepted standardized measurement and verification procedures. Investors in retrofits are informed of performance risk but often do not have the expertise necessary to evaluate the complex technical details associated with an energy efficiency project, which is required in any standardized due diligence process.

Depending on the individual's expertise, several types of information is needed to evaluate a successful retrofit project. The transaction costs of such due diligences are made up of collecting and assembling data and increases even further when multiple actors are evaluating it independently. Transparency and open source innovation is key elements to successful and trusted schemes and programs. Making all the different actors and professionals explain and develop schemes together, to ensure that all parties discuss and cover different risks, eliminates uncertainties and make actors feel included.

Creating an actual psychical platform for actors and stakeholders provides cities with the advantage of reaching more people more effectively, to inform them upfront and to consult and develop ideas together in a more efficient manner. The idea is to make it easier and transparent for everyone interested in participating, and to avoid additional sub optimizations, where everyone tries to invent the wheel each time.

Copenhagen is currently organizing a strategic partnership with the largest building owners and administrators in a network with the goal of involving them in making a charter and voluntary agreement about energy reduction. With the successful enrollment of 20 of the largest building owners, Copenhagen will be able to cover 15 % of the total heated floor space.

The platform will serve the option of inventing something that everyone could comment on from their own point of view in terms of experiences and prior successes and failures. Ideas can be improved co-jointly in a public-private collaboration.

The partnership arrangements could prove quite valuable for cities, in addressing both demand and matching investors with building owners. Activities could include the exploration of existing and potential processes in workshops bringing new solutions and experiences to the table. The partnership needs to rely on an agreement on participating in a network that shares data

and creates new materials, such as schemes and assessment tools. Depending on the specific building stock strategy of each city, preferred actors and stakeholders could differ.

The challenge is not only to form coalitions of different actors, stakeholders and professionals, but further to ensure a productive collaboration. Creating an environment for this to work goes beyond pooling different actors together. The key is to make partnerships valuable and useful for all participating actors. Data assemblings, schemes, programs and so forth have the potential to become standardized and created from a multi-actor perspective, ultimately driving the up-scale of retrofits. It also has the advantage, that the different parties can explain why certain elements or (financial) requirements are needed from their perspective, to ensure complete project preparation. In collaboration, they would have to be assessed with a checklist, for their scaling feasibility, financial credibility, technical practicability and international applicability in order to ensure interest for many participating actors.

Local conditions mean that some schemes are more favorable than others in certain areas, especially due to the different in types of building stock, which is why it is important for cities to develop these schemes and programs in collaboration with city e.g. developers and private homeowners. What do they actually want? Where do they struggle? Is it a question of finance or is it lack of information and standards? Even though business terms are favorable companies might not be willing to invest or conduct business within this field, which is why it is important to talk to them, and consult with companies and banks, e.g. in working groups, in order to manage and develop expectations and to discuss local conditions for a commercially attractive solution. It should be pointed out, that an initial phase would require cities to invest time and effort in 'holding hands' with the different groups of actors and users.

To summarize, cities can:

- Identify a framework for multi-actor collaboration corresponding to a city strategy
- Create a platform for strategic partnerships and collaboration between market professionals
- Generate productive partnerships from multi-actor management
- Standardize materials, assessments tools and financial procedures
- Encourage data reporting in open network co-operations
- Supplement new materials with demonstration cases and trial and error evidence

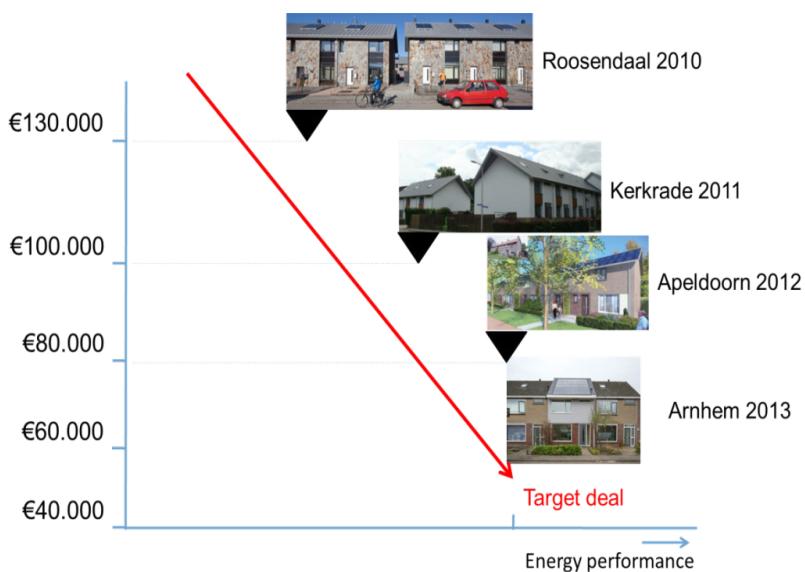
Demonstrations and verifications

Developing new schemes and assessment tools does not necessarily provide actors with accurate models and processes. Inaccuracies in the development of e.g. baselines can affect the subsequent accuracy of the model, possibly resulting in overly optimistic projections of energy savings and even an inaccurate assessment of verified energy savings.



The commonly developed materials must be combined with live trials and errors in different demonstration settings, in order for it to function as new working materials. The more convincing case studies with the applied tools prove to be, the more likely we are to develop model and estimates that reaches standardization.

Partnership arrangements should therefore ideally go beyond joint development of standards, to include risk-sharing activities, such as demonstration cases to assess the potential. Here, cities play an important role.



In the city of London, different case studies provide evidence and experiences with operations, design and price targets that support the co-joint development of new retrofitting programs and methods for a city.

Learn the financial language

The analysed material should further be presented to banks and investors in 'their own financial language' in order to eliminate the gap between project ideas and actual bankable projects /

products. The current lack of verified standardized measurement and verification procedures is the first element of unlocking more financial options, otherwise, it cannot be expected that the different financial markets will react to it. Basically, retrofits needs to fit into the world of finance and bonds.

"Climate change asks for significant action to be taken for both mitigation and adaptation. We need to act fast, at scale, globally. With many climate-relevant projects, technologies and assets, the cost of finance is a key determinant of market competitiveness. However, access to low-cost finance can be a challenge, particularly for smaller players. The financial community – investors as well as banks and insurance companies – often lack the expertise to assess climate-related risks and opportunities. This can lead to funding gaps, holding back project / asset deployment. For us to make progress, it is vital for the real economy and financial markets to work together to grasp the huge opportunities that investing in the fight against climate change has on offer." (Manuel Adamini, Climate Bonds Initiative)

Banks are commercial entities and they will go wherever the opportunities are. Make the cases appear as opportunities for them and they will invest. Acknowledging that investors lack adequate data to support new green portfolio investments, means that what is crucial to identify, is their preferred choice of information. Creating a bankable product or an investment package would have to be backed up by checklists to ensure that all elements of concern are covered. Essentially, the goal is to make corporate investors comfortable with their decision-making by understanding commercial reality. Translating financial terms into key performance indicators for technical building developers and vice versa requires new cross-sectorial partnerships. In a way, it could be seen as a merger, where the goal is to make each department like each other, and understand each other.

To summarize, cities can:

- Learn the financial language and apply it in different project proposals
- Secure adequate data levels and check-lists for financial decision making
- Create a transparent and informative environment for all stakeholders

1.3. Recommendations

Up-scaling retrofits requires standardization of efforts and methods, based on a size and volume in market demand, supported by both public and private funding. A building retrofit is a product that needs development in many areas, including a more nuanced exploration of demand, in order to reach both standardization and size. The figure below presents a collection of roles and responsibilities proposed for cities throughout this report.

It should be noticed that the relevance and order of sequence for executing the different tasks and taking on different roles, differs a great deal from city to city. For each individual city, launching new activities and taking on new roles should be ranged and prioritized prior to any actual engagements. The different rankings should be based on the level of maturity for each city regarding existing efforts of collaboration, a proper stakeholder identification in relation to the actual building stock, and their current operational city strategy for buildings. For instance, the financial platform should preferably be in place prior to identifying possibilities of co-creation, and providing a written major's declaration demands a proper climate plan with green project pipelines to begin with.

Identifying and creating demand

- Categorize different building owners and their building type from the existing building stock
- Use different strategies to approach different building owners supported by the identification of different trigger points and selling points
- Combine new ways of climate-related elements as new retrofit product combinations
- Encourage data reporting in an open source network assembling
- Identify the need for reporting to aggregate data on a larger scale
- Provide written declarations for market predictability and long-term perspectives
- Include visualization strategies for renovated or retrofitted public buildings
- Investigate the use of Green bonds and green city project pipelines
- Collaborate across cities to build a platform for sharing of case studies and aggregation of data
- Aggregate data nationally and share it across cities on trusted data platforms

Financing bankable project proposals

- Identify a framework for multi-actor collaboration corresponding to a city strategy
- Create a platform for strategic partnerships and collaboration between market processional
- Generate productive partnerships from multi-actor management
- Standardize materials, assessments tools and financial procedures
- Encourage data reporting in open network co-operations
- Supplement new materials with demonstration cases and trial and error evidence
- Learn the financial language and apply it in different project proposals
- Secure adequate data levels and check-lists for financial decision making
- Create a transparent and informative environment for all stakeholders