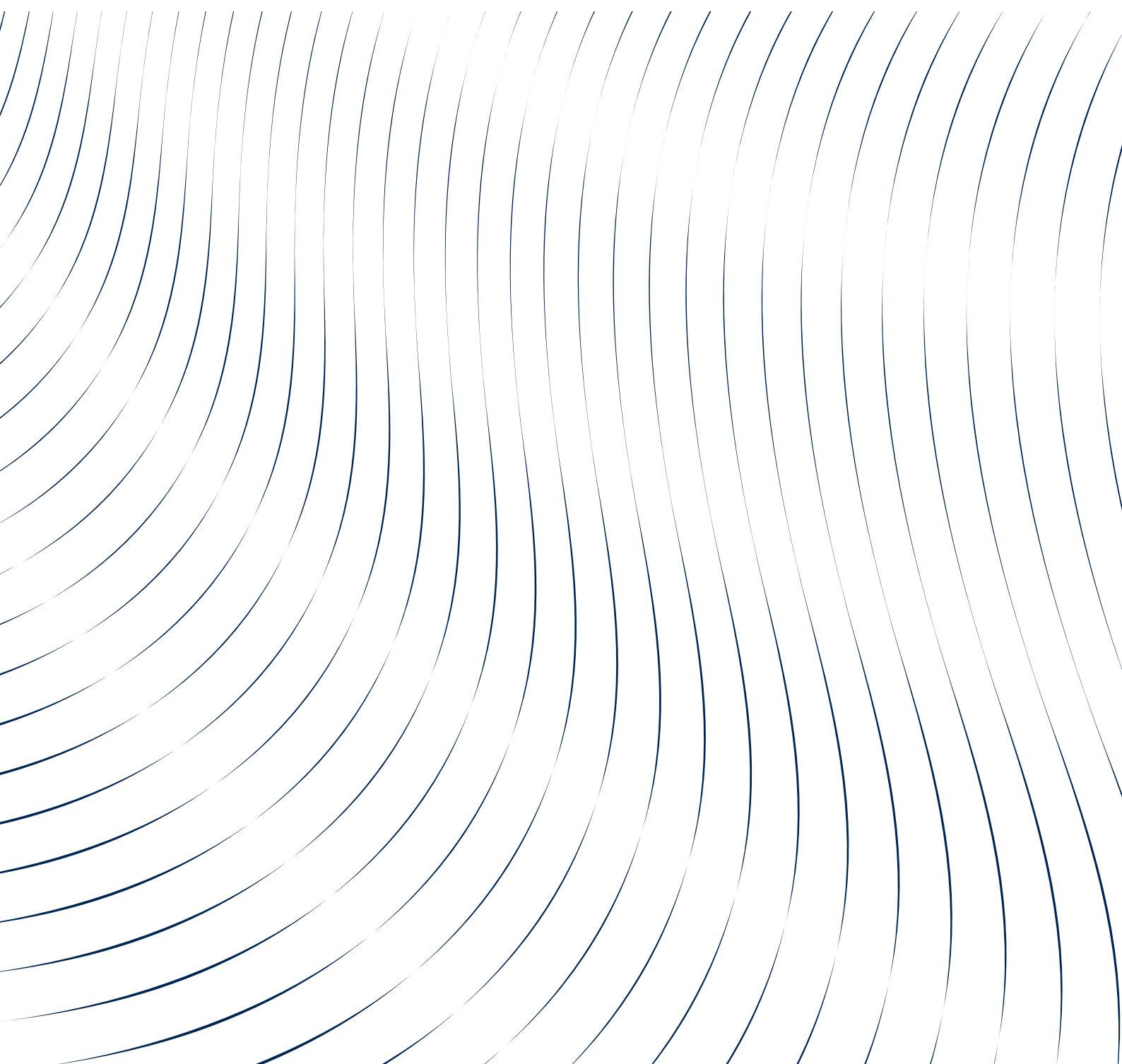




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IMEA CHANGE CASES: A STRATEGIC APPROACH TO PROMOTING ENERGY EFFICIENCY IN THE BUILT ENVIRONMENT

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IMEA Change Cases: A strategic approach to promoting energy efficiency in the built environment

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“The task of promoting energy efficiency despite all obstacles – economic, political, cultural and skills-related - somewhat resembles that of using a magical wand to persuade many different stakeholders to create collaborative advantage in a split incentive situation. Nobody has immediate gains, everybody would benefit from the long-term, integrated solution. How do we do this in IMEA? We develop Change Cases, and share best practices. Let’s call it energy empowerment!” (IMEA participant).

“The core of the integrated thinking is that you have limited resources so you have to use them smartly: You have to think in terms of practical synergy, to recognize and create spill-over effects, to push for joint risk-sharing, and to develop investment strategies based on expectations of future benefits for all this to work. It’s quite a challenge” (IMEA participant).

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Foreword

Danish Building Research Institute (DBRI), Aalborg University Copenhagen, promotes research based knowledge that improves buildings and the built environment. Since the early 70s, DBRI has carried out the research that underpins the Danish Building Regulations, progressively tightening energy requirements and stimulating R&D activities in the Danish housing construction sector. Practical knowledge about adequate building practices, formalised building codes, and energy efficiency solutions does exist. The challenge is to implement the knowledge in practical construction processes, and to construct buildings that actually deliver in terms of energy objectives.

The Interreg 4C project IMEA is important because it sheds new light on the multiple barriers to the implementation of energy efficiency at the level of local governments in different European countries. Also, IMEA has devised a systematic governance approach to better deal with the complexity and 'wickedness' of the EE implementation issue.

The following report is a co-production between DBRI and the IMEA partners from the participating European cities. DBRI wishes to thank the IMEA group for a fruitful and inspiring working experience. Hopefully the report will inspire more European practitioners to implement energy efficiency measures in the built environment.

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Introduction

The implementation of energy efficiency measures has become a European key challenge in the transition towards sustainable cities, as the anthropogenic greenhouse gas emissions affect earth's climate. Cities are actively looking for effective, efficient and proactive new solutions and methods that increase the energy performance of the built environment. The goal is to meet European and national targets in practice (for instance to reduce the overall CO₂ emissions in the European Union to 20 per cent below 1990 levels by 2020) and to gain city-wide benefits in economic, social and cultural terms.

This report communicates key findings and important experience from the IMEA projects that all focus on strategic governance processes aiming to promote energy efficiency in buildings and in the energy system. Our hope is that our work will further inspire decision makers to push for the necessary changes in the complex framework conditions that hinder or facilitate the implementation of energy efficiency. The IMEA partners have decided to work with a joint "Change Case Framework" to highlight the strategic dimension of their work and governance experience. Change Cases (CCs) are specific institutional change agendas where governance actors collaboratively develop problem analysis, change strategy and benchmarks in order to strengthen the implementation of energy efficiency measures in the built environment. By highlighting essential findings of the CC approaches, as well as their distinct experience in promoting energy efficiency, our aspiration is that European professionals will be encouraged to apply the CC approach in their own cities and regions.



Energy efficiency has many benefits as it reduces CO₂ emissions, energy imports and lowers energy bills. Moreover, jobs are created, pollution can be stopped, the indoor climate in buildings is improved, and the quality of life of citizens is enhanced as a result of the transition towards a more energy efficient society. An increase in energy efficiency is achieved when the amount of energy used to reach an output is reduced (e.g. the provision of heat, light, cooling, transport or a product or service). However, there are still many barriers to the uptake of energy efficiency, like for instance its investments. Many energy users continue to be unwilling to invest in energy efficiency for multiple reasons, maybe they lack knowledge regarding potential benefits, or they evaluate costs and benefits associated with specific energy efficiency measures negatively. The reasons why apparently cost-effective investments in energy efficiency are not made are well documented and include (Kiss et al. 2010, p. 1-2):

- Energy prices do not include externalities such as environmental and social impacts
- Knowledge and information on energy efficiency is limited
- “Split incentives”: Goals and incentives are not the same for those who invest in energy-using technology and the actors who pay the actual cost of energy
- Risks and uncertainties are associated with new (energy efficient) technology
- There are uncertainties surrounding the actual energy savings and their value
- Transaction costs (i.e. the costs of collecting information, negotiating contracts, evaluating options etc.) can be high
- The process of change to increase energy efficiency involves many players and is complex to handle



EU Key Policies and Goals on Energy Efficiency

Energy efficiency is a key notion in European policies for green growth and a resource efficient economy. The European Union is ambitious to reduce its overall CO₂ emissions to fight against climate change at European and international levels. The EU Heads of State and their governments decided in 2008 to achieve a 20 per cent reduction in CO₂ emissions by 2020. To help Member States to reach this goal, a 'Climate and Energy' package was set up by EU leaders, and approved by the European Council (Pocas, 2013, p.9). The broad package is a set of binding legislation which aims to ensure that EU meets its climate and energy targets for 2020, including a minimum 20 per cent reduction in greenhouse gas emissions to below 1990 levels, 20 per cent renewable energy in final energy consumption, and a 20 per cent reduction in primary energy use (compared with projected levels), achieved by improving energy efficiency. The EU has offered to increase its emissions reduction target to 30 per cent in 2020, on the condition that other countries commit to similar ambitions (Ea Energy analyses, 2012 p.4, European Commission, the 2020 climate and energy package, 2015).

These policy measures are named the "20-20-20" objectives and represent an integrated approach to climate and energy policy that aims to fight climate change; improve the EU's energy security, and strengthen its competitiveness. The European Commission has developed some regulations in order for the Member States to achieve these objectives. Those regulations set out the legal framework within which each country can draft and implement national policies and standardizations.

The European Commission's vision for energy efficiency focuses on three main documents (Pocas, 2013, p. 10): 1. The Energy Efficiency Plan 2011 (the plan promotes the improvement of communication and consumer awareness on energy efficiency, encourages the public sector to renovate at least 3 per cent of its buildings per year, and anticipates the use of Energy Performance Contracts for the energy service companies). 2. The Energy Efficiency Directive (makes the role of the public sector model, smart meters and energy audits of the Energy Efficiency Plan 2011 binding). 3. The Energy performance of buildings (provides particular coercive measures to reduce carbon emissions resulting from buildings and all EU member countries are obliged to follow concrete measures on the energy performance of buildings).

Currently, reaching the goal of a 20 per cent reduction in energy consumption is behind schedule (p. 9) accentuating the need to pursue a broad-ranging approach to improving the energy efficiency of the built environment (public buildings, office buildings, shops and houses). 40 per cent of the total energy consumption in the EU is due to buildings. Heating is the main consumer of energy in the housing sector, and considerable improvements in the energy efficiency of existing homes will result in substantial savings in energy consumption. Hence, improved energy efficiency in buildings is a key in reaching EU's 20-20-20 targets and to meet the longer term objectives of our climate strategy as laid down in the low carbon economy roadmap 2050. The Directive 2010/31/EU on the energy performance of buildings stipulates that by 2018 all public buildings should be Nearly Zero-Energy Buildings, and by 2020 the same target should be applied to all new buildings in EU.

The IMEA project reflects the common effort of 10 key institutions from 5 Member States to improve the policy environment in the field of energy efficiency. From this perspective, the project aims to build bridges between the European key targets and national, regional and local policies by promoting new ideas and approaches to enhance energy efficiency in buildings and the built environment. IMEA is funded by the Interregional Cooperation Programme INTERREG IVC, financed by the European Union's Regional Development Fund.

The purpose of the IMEA project

The purpose of IMEA is to promote energy efficiency in the built environment by sharing and developing innovative knowledge on integrated energy efficiency measures. The main objective is to support local and regional authorities in their efforts to take a proactive role in developing integrated implementation strategies enhancing energy efficiency in the built environment. 10 partners from The Netherlands, Romania, Portugal, Hungary and Denmark collaborate in the IMEA project, set up to run in the period 2012 to 2014 (www.savingenergytogether.eu).

The IMEA group has focused on the strategic and practical steps in working with energy efficiency in an integrated way, addressing energy efficiency improvements in buildings and in the energy systems of the participating cities. To do this efficiently, the group has developed a joint CC Framework, which is a joint approach that focuses on how to strategize and implement specific energy efficiency measures (see below).

In the first part of the report, some of the general findings and results are discussed. We look across all cases, and highlight key mechanisms and steps developed by the IMEA partners working with their CCs to operationalize and implement the integrated approach to energy efficiency. In the second part of the report, all the CCs are presented as a source of inspiration and as documentation for the dedicated efforts of all partners in the IMEA programme.



The integrated approach to energy efficiency

The integrated approach to urban issues and governance has been on the European agenda for more than 40 years. The European Commission articulated the idea in the 1970s, in programmes targeting poverty and disadvantaged neighbourhoods, and further developed it in urban development programmes that combined physical investments with social and economic investments. In 2007, the EU Member States upheld the principle of *integrated sustainable urban development* in the Leipzig Charter. As the IMEA group understands it, the core of the integrated approach is that the public authority adopts a holistic focus on a geographical area, and seeks to promote vertical and horizontal integration across sectors and public-private boundaries in order to develop mutually beneficial collaboration processes that translate into better and cheaper solutions and outcomes.

Experience tells us that often energy solutions are known in terms of design, technical standards and practical application. The difficulty is to finance green solutions, and to manage decision-making processes between many stakeholders *preceding* the actual decision to go for energy optimization in a tight market. A decision to renovate a home (regardless of ownership) typically has to do with necessity ('the roof is leaking') or a wish to improve the building; it rarely has to do with possible energy savings. It is easier to build a green retrofitting business case if the building is being renovated in any case; and much more difficult if energy efficiency is the primary concern in a renovation project. Therefore, when developing integrated approaches to energy efficiency, it is important to examine how energy issues can be planned together with solutions to other needs and concerns relevant to the built environment.

The IMEA group does not underestimate the challenge. From research we know that "energy properties of the built environment include much inertia, and long lead-times are needed to achieve substantial change, apart from when there are opportunities for retro-fitting" (Wilkinson et al. 2007, p. 1177). As the report will show, the attempt to upgrade old buildings to energy efficient standards is a challenge, and innovative energy efficiency technology is not always compatible with the existing housing structure. Also, households, companies and institutions might have little incentive to invest if the cost-effectiveness of energy efficiency measures is questionable, and if added values are more theoretical than actual.

Studies show that in Europe the growth of energy efficiency in the built environment does not correspond to a parallel energy saving. Data demonstrate that between 1990 and 2009 energy efficiency in the household sector increased by 24 per cent, at an average rate of 1.4 per cent per year, but the final household energy consumption increased by 13 per cent during the same period, at an annual average growth rate of 0.7 per cent (Lombardi and Trossero 2013). The point is that improvements in efficiency go hand in hand with "economic growth, rising expectations, social changes, and population increase" (Wilkinson et al. 2007, p. 1177). As the world's wealth increases, "energy-using devices are developed and deployed to fulfil our needs for productivity, recreation, security, comfort, and health" (ibid.).

From the IMEA perspective, the point is that not only are energy efficiency measures difficult to implement, they are also undermined by the steep growth in consumption patterns, a fact that only underlines the necessity to act. To promote energy efficiency, we recognize that social awareness is essential to foster necessary behavioural changes. The IMEA group is a community-of-practice that seeks to inspire and motivate more communities-of-practice and local stakeholders to engage in energy efficiency issues.

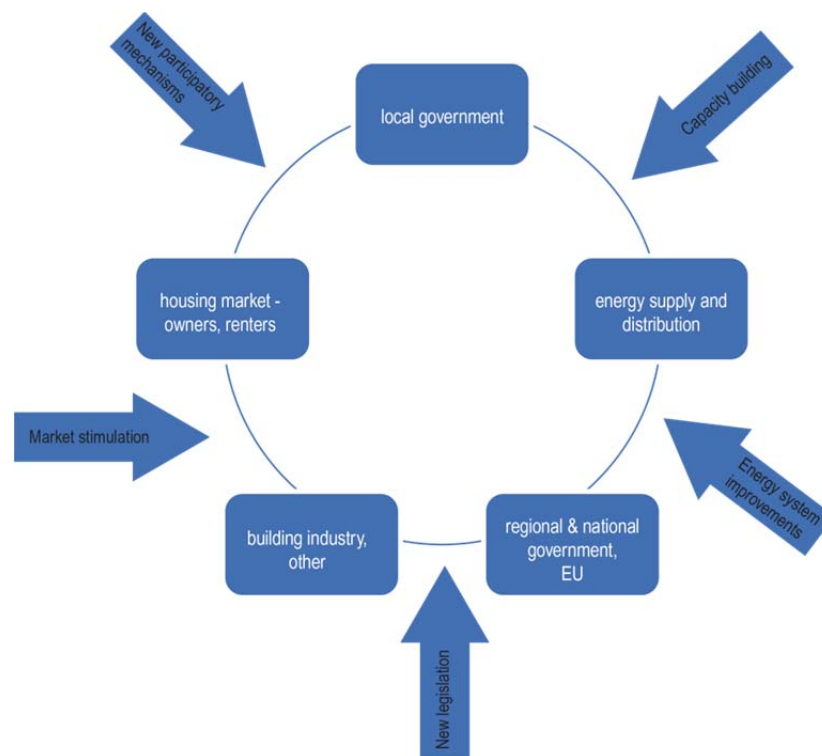


The IMEA partners have identified a number of general characteristics of the integrated approach to energy efficiency that transcends the particular boundaries of specific energy efficiency projects and their national institutional contexts:

- Integrated solutions are in principle based on a *systems view*: If we look at all sectors of society, and the roles they play in relation to energy efficiency, how can we continuously connect them in new and better ways to promote energy efficiency?
- The integrated solutions are typically developed in a *geographical context* in which the different policy areas can be integrated in area-based programmes and interventions to facilitate comprehensive energy retrofitting in dialogue with stakeholders, typically citizens as building owners. Some IMEA projects focus on optimization of energy provision structures also using the geographical context to contextualize or territorialize governance of multi-actor networks, balancing general standards and cooperation mechanisms with tailor-made solutions

- Coordination and integration requires cooperation and *public-private interaction* to create synergies, and to catalyse private resources in a municipal strategic context in which the municipal funds are used strategically to create a catalyst effect ("seed money")
- A key goal of integrated energy efficiency is to create *added value* to citizens, building owners and the community by working holistically, developing "energy renovations + added value", i.e. concrete solutions that meet environmental, social and economic needs while adding extra qualities (comfort, aesthetics, functionality, lower running costs etc.)
- The prerequisite for successful integrated energy efficiency mechanisms is typically '*green*' *financing solutions* that need to be set up in collaborations between authorities, consumers, financial institutions, energy companies, construction business and others

Integrated actions across multiple sectors in the local community



The integrated approach identifies value creation in terms of new innovative ways of implementing energy efficiency at the boundaries between the market, the state and civil society. Experimenting with new hybrid forms and ways of crossing these boundaries, integrated approaches focus on market stimulation, capacity building and systems integration. The integrated approach is per se open-ended; there is no prior blue-print. It has to be developed in the complex interaction between many participants. To steer this process, the IMEA group agreed to the CC Approach.

The IMEA Change Case Approach

The promotion of energy efficiency in the built environment can be viewed as a “wicked problem” issue (complex, long-term, hard to finance, many stakeholders, solutions at many levels) that requires a multifaceted strategic response where planners and decision-makers develop institutional capacity to cope with the joint challenge. In other words, all IMEA partners are engaged in energy efficiency projects that are hard to promote for multiple reasons. Developing the IMEA cooperation, partners decided to discuss and exchange experience at a level between specific project activities and the national institutional contexts. This ‘meso-level’ between the general (national context) and the specific (projects, concrete steps) focuses on partners’ efforts to govern change processes in multi-actor environments implementing energy efficiency solutions.

To be able to identify and discuss this strategic level with which all projects struggle, the IMEA group formulated the notion of ‘Change Case’ (CC). A CC was defined as a heuristic that outlines

- 1 *A baseline analysis* of how to promote integrated energy efficiency measures with a clear problem definition and a clear strategic objective
- 2 A proposed *institutional change strategy* that addresses the identified problem and proposes specific steps to reach the stated goal
- 3 *Benchmarks* that allow for outcome evaluations, feedback measures and strategy improvements

When IMEA partners have set up their CC in relation to their specific area of concern (more and better green retrofitting in urban renewal, more renewable energy in the energy system, sustainable renovation of historical buildings etc.), they made a SWOT analysis as a means to sharpen their strategic views on how to carry through the CC process with success.

The IMEA CC Approach

1. Baseline analysis: Objective, context and nature of challenge

The baseline analysis describes the key issue to be dealt with: Problem definition, institutional context, and a clear strategic objective that relates to the specific strategic change perspective in the national project. Relevant parameters in the baseline analysis may be: Urban and housing structure, CO2 targets, key legislation, funding mechanisms, relevant public programmes and schemes, and a SWOT of key stakeholders and institutional players which impact policy implementation.

2. Change strategy, learning agenda and key drivers

A change strategy is a strategy that describes specific steps towards an improvement in the institutional framework (public-private relations) for dealing with a specific problem. When carrying out a change strategy, public and private professionals working with policy implementation need to be involved in developing collaborative ties and new proactive practices. The learning agenda associated with this innovation relates to the specific new knowledge requirements necessary to carry out the change strategy. Key drivers are the

specific mechanisms by which the change strategy is implemented.

3. Benchmarks and expected outcomes

Benchmarks and outcomes need to be clear and measurable for the progress of the change process and its results to be measured and validated. Benchmarks are crucial for establishing feedback mechanisms that allow for improving governance measures “as you go”.

4. A SWOT analysis of change cases as a starting point

When objective and change strategy is clear, the CC project owner conducts a SWOT analysis (of strengths, weaknesses, opportunities and threats) and discusses this analysis with stakeholders and IMEA partners.

How do Change Cases 'strategize' good practices?

The CC framework is a hands-on approach to a complex challenge. In fact, the task is one of developing *institutional capacity* to push for positive implementation of energy efficiency measures in complex multi-actor contexts with multiple barriers (path-dependencies). The CCs are laboratories of sorts, framing institutional learning process that need to be governed. In our understanding, to 'strategize' (Healey, 2007 p. 28) means to envision, see and understand potential values of actions and events in a complex and dynamic steering context with many stakeholders, and to use this understanding to influence institutional framework conditions (laws, administrative practices, contractual arrangements, funding mechanisms, markets) to achieve certain ends. Or in short: To push for positive outcomes in a steering context characterized by a mix of (dialectic of) top-down and bottom-up processes. The IMEA CC approach can be understood as a very concrete approach to strategization, and as a heuristic that stimulates this kind of thinking.

Example of format for developing CCs

Key focus	Problem analysis	Institutional change dimension	Change strategy	Drivers/actions	Stakeholders	Benchmarks
Fill in	-	-	-	-	-	-

Method and data

The data presented in the report is qualitative and collected by the IMEA partners themselves in a systematic dialogue with the authors. The process of developing the CCs has been organized in two phases:

Phase 1) The development of a joint approach to creating an effective community-of-practice in the IMEA group (2011-2012). The IMEA partners agreed to a joint method proposed by the authors: To work with CCs, and to visit each other bilaterally as 'critical friends' to support the development of CCs.

Phase 2) The development of the actual CCs and best practice examples to inspire CC development (2013-2014). Using the CC framework, partners gradually developed their own change processes (maturing their key focus, problem analysis, change strategy, stakeholder involvement actions etc.) and used this emerging understanding to identify specific areas of dialogue and exchange relevant to their own strategy development. In all phases of development, the authors engaged in a questions-and-answers exchange with CC stakeholders to assist them in the process. Pinpointing areas of interest, IMEA partners made bilateral arrangements for collaboration and 'critical friends'-visits exchanging knowledge and ideas to strengthen their own practices.

In the project period (2012-14), CC seminars and workshops were arranged to develop CCs, evaluate strengths and weaknesses of existing practices, and to adopt a bird's-eye perspective on possible innovations. The learning approach of the IMEA group was one of developing new strategies while reflecting upon existing institutional practices to better stimulate proactive governance behaviour and a more efficient implementation of energy efficiency measures. In these reflection-in-action processes, all partners posed questions to their colleagues in the IMEA network. For example, the Danish CC posed these questions in a letter to partners in the fall of 2012:

Dear partners,

We are currently developing our urban renewal practices to promote more and better energy efficiency projects. We would like to discuss some of the following questions with you:

- How to develop proactive administration practices that improve energy efficiency in urban renewal projects?*
- How to create synergy between energy efficiency and architectural norms and standards? Examples?*
- Experience with innovative energy efficiency partnerships and value creation from demonstration projects (Green City Laboratory)?*
- How to sustain and improve horizontal collaboration in pillarized systems and better support citizens' participation in sustainable urban renewal?*
- Experiences with successful innovative funding mechanisms in relation to energy efficiency and building renewal?*
- Experiences with developing the energy efficiency strategy in area-based approaches?*
- Good ways to benchmark energy efficiency results in urban renewal?*
- Do you have suggestions for a new and more ambitious city strategy for sustainable urban renewal in Copenhagen?*

The IMEA partners are responsible for their own CC accounts (see p. 45-95) while the authors are responsible for the first section on key lessons. The lessons have been identified in a two-step process: First they were deduced in a retrospective desktop analysis of key challenges as they emerge across all CCs covering the entire project period. Second, all lessons have been debated and further qualified at IMEA-workshops and written exchanges between all IMEA-participants. 25 qualitative interviews have been carried out during the project period to inform about general lessons as well as the on-going CC development. The report has been discussed and approved by the IMEA group at a final seminar.



Experience from the IMEA projects

In the following, we highlight key experience regarding the change case approaches that have been developed in the IMEA projects. The account does not exhaust all relevant experiences in all CCs, for a complete elaboration of key issues the reader should contact the IMEA partners directly.

Description of IMEA Change Cases, project start June 2012

Partners in IMEA	CC focus	Problem analysis	Institutional change dimension	Change strategy	Drivers/actions	Stakeholders
<p>The City of Oradea</p> <p>The Romanian Ministry of Regional Development and Tourism</p>	<p>Sustainable urban development</p> <p>Mechanisms for cooperation on energy efficiency in historical buildings in Oradea region</p> <p>Establishing of energy efficiency priority zones in the historical centre (mapping); Directions for the new public policy</p>	<p>Lack of energy efficiency renovations in historical buildings</p> <p>No influence on the priorities of the governmental agenda</p> <p>Selecting an area intervention: social needs vs. protection of historical buildings</p>	<p>New national urban renewal legislation to support cities to renovate historical buildings?</p>	<p>Mix cultural preservation policy, spatial planning policy and energy efficiency policy</p>	<p>Capacity building/support local administrations to attract EU funding</p> <p>Raise public awareness of energy efficiency</p> <p>Facilitating know-how and technical support for energy efficiency professionals</p>	<p>Owners of historical buildings</p> <p>Cities</p> <p>Regions</p> <p>energy efficiency professionals</p> <p>Homeowners associations</p> <p>others</p>
<p>The regional authority Mid-Pannon</p> <p>The City of Szekesfehervar</p> <p>The energy provider SZEPHO Zrt</p>	<p>Better Integrated Urban Development Strategies (IUDS)</p> <p>Support EU2020 Strategy and regional policy post 2013</p>		<p>Integrated approach (municipalities and urban-rural relations)</p>	<p>Stakeholder involvement: private and public companies, schools and students</p> <p>Develop guiding framework for Szekesfehervar to update the future energy strategy</p>	<p>Advise and consultancy for the buildings to be converted</p> <p>Lobby governmental level to strengthen strategy and allocate funding for energy efficiency projects.</p>	<p>Private companies; municipality owned companies</p>
<p>The City of Assen</p>	<p>To motivate home-owners to invest in energy efficiency</p>	<p>Inadequate energy efficiency investment process</p>			<p>CRM-approach</p> <p>Regional energy renovation team</p>	<p>Home-owners</p> <p>Regional installation companies</p> <p>Real estate</p>

					One-stop shopping Collaborative involvement New funding mechanisms	Brokers Financing institutions Advisory companies
City of Copenhagen	Sustainable urban renewal	Weak stakeholder involvement Reactive public role	Innovative demonstration strategies: different projects are on different scales; demonstration project; area-based approach; innovation tracks	Rethink sustainable renewal practice	New synergies between preservation and renewal Smart projects New partnerships	Homeowners Contractors, Urban regeneration agencies others
The Portuguese social housing association, Gebalis	Community empowerment related to energy efficiency in a multicultural setting			Participatory SWOT analysis	Allocating of income from micro-generation to proximity services	
The inter-municipal organisation CIMLT, The Portuguese Directorate for Geographical and Territorial Development DGOTDU	Energy matrix Cross-municipal energy strategy, Lezíria do Tejo	Deficient coordination and integration vertically and horizontally	Relation between energy matrix and CIM-process?		Energy Matrix Geographical Information System (GIS) Energy council	Energy providers Public agencies

Because all the CCs have different foci and operate in different national contexts, a wide range of issues are targeted and dealt with in the IMEA programme. Below we present the main conclusions from the IMEA programme based on IMEA partners' work in the different CCs.

The key lessons are:

- 1 Promoting energy efficiency in the built environment is structurally difficult (Oradea, all CCs)
- 2 The key is to stimulate market demand for energy retrofitting projects (Assen, Copenhagen)
- 3 Energy efficiency and social empowerment can go hand-in-hand in socially distressed neighbourhoods, but it is a long-term challenge (Lisbon, Gebalis)
- 4 Energy efficiency can be promoted by spatial strategic planning (Assen, Copenhagen)

- 5 The transition towards sustainable energy can be a long-term process (Székesfehérvár)
- 6 Energy policy can be a driver for regional territorialisation (“Baixo Car-bano”, DGT & CIMLT)
- 7 The Change Case Approach is recommendable

1. Promoting energy efficiency in the built environment is structurally difficult

As a policy issue, promoting energy efficiency in the built environment can be perceived as a wicked problem issue, and the IMEA CC Approach is designed to shed light on structural barriers for improved energy efficiency in order to build institutional capacity and better framework conditions at different levels simultaneously. Mapping out and analysing these barriers can be a frustrating exercise, but it is a first step towards a positive change, as clearly illustrated by the Romanian IMEA partnership (for the full CC account see p. 71-75). All CCs confront structural barriers at different levels, and from a practitioner’s perspective, change processes are painstakingly slow in all countries.

In Romania, the City of Oradea and the Ministry for Regional Development & Tourism has formed a partnership to push for innovation at both city and state levels simultaneously, focusing on energy retrofitting projects in historical buildings in Oradea and in Romania. The complexity and interrelatedness of barriers is evident:

- 1 There is lack of a national policy framework for renovation of historical buildings in Romania, and a first step is to formulate such a policy at the national level to enable cities to engage in this area.
- 2 In Romania, there is a strong national and local reliance on EU funding for policy initiatives, a reliance that in fact hampers the emergence of a real nationally planned and financed policy. In the Romanian reality, the issue is how to orchestrate institutional capacity building despite a dependency upon multiple EU programs.
- 3 There is a lack of technical and architectural solutions adequate for the preservation and energy efficiency improvement of historical buildings in the country. Also, there are only few actual examples of energy efficiency improvements of historical buildings to learn from, and a lack of skills and knowledge concerning energy efficiency in the construction sector.
- 4 The housing market is almost entirely privatized making it fragmented and difficult to regulate from a public governance perspective. Because almost all dwellings in the Romanian housing market are privately owned, urban renewal initiatives depend on owners’ consent, which again depends on their purchasing powers or lack thereof.
- 5 There is a weak or absent strategic planning mechanism at the local level in relation to urban and housing policies. Generally, public authorities do not emphasize the role of collaborative strategies in the planning of public policies, and the development of local capacities for strategic planning is not stimulated from the national level. Also, there is a lack of public funds to support such strategies, except in the case of EU funds and programmes. The weak collaborative planning tradition hampers involvement of private owners in energy efficiency projects.



Oradea town centre

In the Romania Change Case, the key idea was to establish a partnership between the City of Oradea and the Ministry of Regional Development and Tourism to promote energy efficiency measures in relation to the renovation of historical buildings. The idea was that the ministry would assist the CC process in Oradea by making the type of solutions and investments identified and analysed in an energy efficiency study of the historical building stock in Oradea eligible for funding under the Regional Operational Programme. To do this, the ministry would provide 1) a unitary legislative framework, 2) elaborate territorial planning documentations, and 3) integrate the territorial dimension in the operational programmes through which structural funds are administered. Further, the idea was to use the IMEA experience as an inspiration for setting up national programmes for urban renewal projects also with a focus on energy efficiency and to improve the national laws that impact investments at the level of historical city centres. As it happens, national engagement in this partnership has ended without the intended results, with reference to the argument that the activity should be funded only by EU funds (The Regional Operational Programme 2014-2020).

As a consequence, Oradea has taken a step-by-step approach working with its own means and experiences pushing forward the energy efficiency agenda. The city has a refurbishment programme aimed at renovating the facades of historical buildings that is expanded to include energy efficiency measures. Oradea City Hall offers a subsidy of up to 20 per cent of the total investment costs of a refurbishment and a 5 year loan covering the remaining 80 per cent of the investment at a 0 per cent interest rate. Also, city hall pays for energy reports and technical studies of buildings. To further support the energy efficiency agenda, the city has taken on a number of support activities:

- Mapping. A detailed registration and analysis of buildings in terms of refurbishment needs
- The formulation of a local policy to protect historical buildings
- The setting-up of a local funding scheme
- Targeted fundraising (EU funding) for energy efficiency projects
- Awareness raising of energy efficiency (brochures, public exhibitions, meetings, contests, etc.)
- Facilitation of know-how and technical support for energy efficiency professionals
- Energy retrofitting of the city's own municipal buildings

“We should work on the experience that is going to be cumulated through this local program for rehabilitating the facades of the buildings-historical monument from the City Centre in order to elaborate other policies regarding urban renewal, increasing the attractiveness of the city centre, and why not integrate energy efficiency in a larger-scale process regarding the refurbishment of most important or even all buildings from the historical city centre?” (IMEA partner, Oradea).

The reality of multiple structural barriers is in fact hindering the implementation of energy efficiency measures in historical buildings in the City of Oradea, and therefore also in other Romanian cities. The Oradea CC has been instrumental in outlining necessary first steps in a long-term effort to promote energy efficiency and sustainable city development in Romania.

2. The key is to stimulate market demand for energy retrofitting projects

In Assen, the city planners have cooperated with citizens and market actors to push for energy efficiency in different housing districts in the city (p. 66-70). The basic approach is to integrate relevant actors in the value chain: developing a better specific renovation package to the house owner that clearly shows costs and benefits to support the renovation decision. To do this, planners and market actors have jointly pushed for a market development (a one-stop shopping concept) that is possible due to cooperation between different private consortia in the energy efficiency field. The biggest remaining difficulty is financial, how to bridge initial costs and long-term benefits financially?

The municipality of Assen has developed the elements of the energy efficiency programme in the context of an area-based approach, where different municipal departments coordinate their efforts to activate and mobilize homeowners and tenants to become involved in energy retrofitting and take ownership of the process. This dimension of horizontal cooperation in an area-based approach has proven effective. When the city combines tailor-made solutions in the housing district with the one-stop shopping approach, homeowners, social housing associations and tenants do in fact decide to invest in energy efficiency measures. Assen has succeeded in mobilizing citizens to take on the role of ambassadors inspiring their neighbours to make energy retrofitting. In the Assen region, social housing associations have agreed to implement energy efficiency measures in agreement with their tenants in exchange of benefits in other projects, and homeowners can voluntarily join the renovation programme of associations hereby profiting from economy-of-scale advantages.

The city has a policy framework for this in a housing agreement, and in specific contract performance agreements with housing associations. To support the collaboration, an external advisor is involved to make a good contract and suggest energy efficiency measurements for the specific building. Dutch social housing legislation allows housing associations to transfer energy efficiency renovation costs to rents, but reasonable deals concerning rent increases still have to be negotiated with tenants.

“IMEA has given us focus in our policy: We have focus on improving the energy efficiency of the built environment. Slowly we see effects: Local residents are inspiring each other to invest in energy efficiency measures. We stimulate construction companies to improve cooperation, and to develop their energy efficiency products. The companies cannot offer the attention that each individual resident needs; they cannot guide residents through the customer journey. They see a large market, but the business model is too weak. My point is: Guiding end-consumers through the customer journey is the responsibility of the government” (IMEA partner, Assen).

The IMEA group in Assen stimulates market demand for energy efficiency through the one-stop shop in which different private companies show integrated solutions, and through the ‘customer journey approach’, where groups of residents are educated about energy efficiency issues by city planners:

“We have good experience in guiding individual residents (via advisors paid by the city), but it is more effective to guide groups of residents within their neighbourhood through their customer journey. This is cheaper, and more effective. With the IMEA project, we proved that it is possible to create such groups with encouragement from the City Council. We support the groups with technical knowledge, knowledge of joint purchasing, best practices, and we help them work together. This might sound quite intense, but it does not have to be. Often, residents’ groups only occasionally need help. But it is City Council that bears the responsibility for this help, in close dialogue with people in the area” (IMEA partner, Assen).

In order to govern the entire process stimulating market demand, the Assen planners have created a knowledge platform covering all relevant issues regarding energy efficiency in relation to the local building structure, knowledge that also guide the area-based approach in specific neighbourhoods in the city:

“We have information about the age of buildings, the value of the property, the indicative energy label, about energy consumption (gas and electricity) and about the income of owners. With this knowledge, it is possible to tailor specific intervention strategies in different selected neighbourhoods. In some districts we can see that energy efficiency potentials are high, and that inhabitants are well off and potentially capable of investing in energy efficiency. But they lack a sense of urgency and understanding of potential energy efficiency benefits, which we then bring to them. In other districts people suffer from energy poverty, and we have to tailor financing solutions to deal with this problem. All in all, IMEA gave us a good understanding of the energy efficiency task within our city. We now know a lot about methods to help residents

achieving energy savings in their own home, and energy efficiency is a cornerstone in our policies and in our area-based approach” (IMEA partner, Assen).

The final element in the Assen approach to stimulate market demand is a new green financing scheme developed by the city in collaboration with banks, contractors, social housing associations and other public bodies, called the ‘zero-to-the-meter’ model. The model creates an economic incentive for private owners to energy retrofit their homes so they can provide for their own sustainable energy for heat and electricity. The contractor that performs the energy retrofitting issues an energy performance guarantee for 25-35 years, fixing consumption costs during the period. The zero-to-the-meter energy retrofitting is combined with a management & maintenance contract. The owner pays ‘zero’ because consumption is balanced-off from renewable energy revenues.

The scheme is funded by the Municipal Credit Bank (CCB) [De Gemeentelijke Kredietbank (GKB)]. The bank provides a low-rate green loan based on the level of expected energy savings and savings on future maintenance. The partners behind the scheme (contractor, bank, public authority) collaboratively determine the projected costs and benefits of a specific zero-on-the-meter project. They examine the extent to which the intrinsic value addition may be fully charged in the asking price and under what conditions, to be able to guarantee that the substitution effect of reduced energy costs outweigh energy retrofitting expenses and services.

The key drivers in the Assen project to stimulate market demand for energy retrofitting projects thus are

- Raising awareness by making present energy use and saving possibilities visible.
- Innovative financial arrangements
- Central ‘energy retrofitting desk’ with proactive approach towards homeowners (CRM approach) on regional level
- Clear and unambiguous promotion scheme aligned for all governments
- Cooperation with homeowner corporations and area-based approaches to address groups of homeowners



Green wall and solar panels, Copenhagen

The *Copenhagen* Change Case in the IMEA project explicitly seeks to promote more and better energy retrofitting projects in the public building rehabilitation program in the City of Copenhagen (p. 45-52). Private building owners can apply for a state and municipal subsidy if their building qualifies according to certain criteria. The key challenge is to introduce energy efficiency measures in subsidized renovation projects because owners hesitate to take on the extra initial costs associated with these measures. Another key barrier is that city planners cannot share their knowledge of energy efficiency measures with specific applicants to avoid positive discrimination of applicants who should be treated equal before the law. Planners cannot engage in specific projects to push for better energy efficiency solutions, be-

cause this would create an unfair playing field for applicants. Therefore, the primary method available to promote smart energy efficiency projects is to choose between different applications according to specified criteria.

To stimulate demand for smart energy retrofitting, the Danish IMEA team initially focused on formulating a new strategy for sustainable urban renewal (2013-17) in Copenhagen. As it turned out, the city administration decided not to formulate a new Copenhagen strategy, but to push for specific innovation activities in green retrofitting while strengthening its administrative procedures. In their integrated approach to energy efficiency, planners emphasise innovations in the building renovation scheme that allows for a proactive municipal role, a role that enables planners to push for more and better energy efficiency projects in the renovation scheme more effectively. This proactive role has primarily been developed in two ways:

1. Capacity building and knowledge sharing amongst market actors and building owners. City planners have developed new energy efficiency partnerships with building owners, contractors and citizens to promote innovative energy renovation projects. Typically, contractors (architectural firms, construction firms etc.) help building owners to formulate the funding application. In 2013, planners made a number of dialogue meetings with contractors to explain the city's new and higher ambitions on energy efficiency with a positive result. Many products are ready for testing, and planners have made different platforms to connect existing energy efficiency knowledge and green tech producers with consultants and building owners. The core of this strategy is capacity building in networks, knowledge sharing, integration of solutions and active street-level involvement. The capacity building is both external relating to the Copenhagen construction and housing market, but also internal in the city administration, where planners focus more on energy efficiency measures. As a result, the number of applications more than doubled in 2014 compared with 2011, and 90 per cent contained energy efficiency measures. In 2013, most buildings were improved to level D, and in 2014 most buildings to level C. As a new standard, the city prioritizes buildings that aim for energy label C or either a 20 per cent or 30 per cent reduction in heat consumption depending upon SAVE values (a Danish system for classification of architectural and historical values of buildings).

2. Testing and developing the energy efficiency strategy in area-based approaches that coordinate existing programmes and strengthen the horizontal integration of administrative planning practices. Currently planners develop an "energy district" in the South Harbour area, combining the energy efficiency focus in building renovations with the area-based urban regeneration approach in a socially disadvantaged district. The geographical area will be used as a test-case for the development of the new proactive approach to sustainable urban renewal. The comprehensive approach will involve a climate partnership with the main energy provider in Copenhagen, involvement of local stakeholders, sustainable energy projects, information campaigns, mapping of CO2 reduction potentials, rainwater collection measures, demonstration projects etc. The area-based approach is intended to promote local ownership of energy projects, and also influence citizens' energy consumption patterns. One aspect of the integrated approach to energy efficiency is an intensified focus on the energy system aspects of buildings. In many housing blocks in Copenhagen, boilers can be upgraded and in many cases boiler systems can be integrated. Crucially, the area-based approach in the energy district focuses on energy efficiency measures in a long-term planning horizon.



Green roof, Copenhagen. The city has a policy to promote green roofs

3. Energy efficiency and social empowerment can go hand-in-hand in socially distressed neighbourhoods, but it is a long-term challenge

"We have no option but to choose a cultural and long-term change that has to begin somewhere. People recognize that. There is a will to change the future" (IMEA participant, Lisbon)

In the Bensaúde district in Lisbon, the social housing association Gebalis has developed a tenants' participation process with a focus on energy efficiency that has resulted in the production of a 'FUNLAB' that educates youth about energy issues (p. 88-95). The ambition of Gebalis is to develop, evaluate and write recommendations for a local implementation plan for future projects with citizens' participation, and to contribute to the awareness and effectiveness of energy efficiency projects.



Bensaúde

Gebalis is a municipal company under private law in the city of Lisbon that manages the city's social rental housing stock. About 25 per cent of all citizens in Lisbon live in social housing. Gebalis aims to ensure an integrated management policy that combines asset management with a social profile focusing on the quality of life of local residents in the different urban districts. To reach successful integrated energy efficiency mechanisms, the Portuguese team hopes to achieve long-term effects by raising awareness amongst young people, focusing on the level of the intrinsic motivation of pupils. In practical terms, Gebalis develops the CC using a social educational methodology.

"People want to have something to be proud of in Bensaúde; they want to be associated with something positive and not negative. We think that energy efficiency can be turned into an example and a way of fighting exclusion. There are gains in efficiency, and those gains should be reinvested in fighting poverty, because that way you can create a positive virtual cycle. So what you achieve in green retrofitting can actually create a surplus that will empower the process" (IMEA Participant).

The CC combines a focus on poverty and social problems with energy efficiency issues. Energy efficiency is not at the top of the list for people living in poor neighbourhoods, and the challenge is *"to address the energy issue in a poverty complex"* (IMEA participant) working with the hypothesis that a change of behaviour in favour of energy efficiency amongst social housing residents through awareness and education has a positive spin-off for the city of Lisbon as a whole. The very first meeting with residents was organized through IMEA,:

"We wanted to go directly there and use a participatory methodology that we used in urban planning in these conditions - to address people and see how they would identify and solve these problems and further see if energy efficiency is directly or indirectly relevant, for instance in terms of revenue and savings, life conditions, comfort, etc." (IMEA participant, Lisbon).

An important aspect of the approach is to foster intercultural dialogue in an ethnically diverse neighbourhood. The meetings brought residents from all ethnic groups together as this issue concerns everybody and as everyone has the same access to speak out (children, women, etc.). As a result of the meeting, it was decided to create a 'fun lab' to bring more liveliness into the neighbourhood. In this lab, an interactive game room was designed that is being used by schools in Lisbon - where the children of this neighbourhood come together with their colleagues from schools around. The programme is also designed to be part of the curriculum and it is all about creating energy efficiency awareness with children in a fun and approachable way.



Win-win Bensaúde Change Case – meetings with residents and children's workshop

4



Oradea, Romania – November 2013

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Due to the lack of money, the partners chose to work out a popular education scheme for energy efficiency, which is aimed at penetrating households through children. Although energy efficiency might not be at the top of the agenda in this neighbourhood, it is getting more important for families and for the majority of the population in Lisbon. Children make up 20-25 per cent of Lisbon's population and having energy efficiency as a subject that is transversal and important for the whole city, the fun lab can slowly prioritize energy efficiency on the agenda. As the general family index in the city is 2,1 (2,8 in the Bensaúde district) the children will directly experience an impact and the families indirectly, as the new information is filtered into the families through the children. The game addresses aspects such as housing and construction materials, equipment and attitudes. In the Bensaúde district,

people are stuck in poverty and thus, stuck in attitudes (they will always choose the cheapest equipment which is the less efficient). However, there is the possibility to learn and save money and opt for more energy efficient equipment which is cheaper in the long run.

The second strategy that has been developed addresses adults, in particular the women of the neighbourhood. The women are restricted in their actions due to their ethnic background: They are supposed to engage in religious and social assistance etc. However, as there is a motivation to earn money and do things independently, a low-cost sewing course has been created where they learn how to better manage home expenditures and further possibilities of savings by using energy efficiency concepts.

The dilemmas in the Portuguese change case are:

- there is no money for basic maintenance activity
- it is a difficult population group to engage in energy efficiency issues
- the political system does not truly wish to allocate social innovation resources
- the context in terms of policy is one of inconsistency and lack of time (short-term)
- there is a lack of a platform for sustainable, long-term maintenance of the social housing stock

“The issue is that none of any policy models were ever allowed the time enough to produce results, which is the key in the entire process. It is not only about thinking of some strategies, but also to introduce this very first layer, which is time and resilience. What you see is inconsistency - that this is our main constrain – the lack of continuity of policies: You ditch everything that has been done and start over, etc. The problem exists on all sector levels, it is a cultural trait” (IMEA participant, Lisbon).

Portugal is essentially in a very structurally difficult position for creating real positive change. With the creation of win-win situations in the Gebalis project, in which a consortium of stakeholders create a shared vision and allocate resources, a more collaborative, long-term and sustainable social progress might be reached. Currently there are too few resources because stakeholder's budgets are not allocated in a coherent and integrated way, and the Portuguese partners depend on attracting EU funding. The Portuguese partners state that despite all there is a slow change, which is made possible primarily through the EU involvement to put things on the agenda:

“I always stress European influence on Portuguese behaviour. The fact that we had Europe with its different perspectives on planning culture, different perspectives on political priorities etc. has benefitted Portugal. We became environmentally sensitive because of the EU. Because of EU, we have reached this new financing stage and focus on new principles like territorialisation which we now believe in. For a long time we have been trying to cease the opportunity for positive change” (IMEA participant, Lisbon).

4. Energy efficiency can be promoted by spatial strategic planning

The city of Assen combines an Energy Certificate Atlas with a city map with a social profile (p. 66-70). In Assen there is an emerging focus on energy poverty, not in the traditional sense of a lack of access to energy but situations where energy costs result in increased poverty in households. Reversely, in some areas of the city, figures show that many elderly people who are relatively well off live in buildings with high energy costs and high improvement potentials. The city hired private companies to gather information on housing standards, energy consumption, the income of people living there etc. The gas consumption was compared with the size of the houses, and on the basis of those figures, areas for energy efficiency campaigns were identified and selected. The city planners are now trying to reach owners and renters in those buildings to develop different approaches depending on forms of tenure in specific buildings.

The city has funded energy performance assessment for about 1000 houses to speed up the process (250 euro per house). All EPAs feed into the GIS database underpinning the energy atlas. The ambition is that 50 per cent of all houses reach a C rating and that 100 per cent has an energy certificate. Focus is on all houses built before 1995 since it became a legal requirement for all houses after 1995 to have a B rating. 'Zero-to-the-meter' houses have reached 80 per cent of the needed 100 per cent to become neutral. Assen municipality has a focus on the last 20 per cent.

"IMEA gives us an understanding of the energy efficiency task within our city, while also getting an insight into the possible methods to help residents achieve energy savings in their own homes. Now we ensure this in our policy and in our area-based approach, integrating the various spatial planning topics" (IMEA partner).



5. The transition towards sustainable energy can be a long term process

The main aim of the Hungarian CC in the City of Székesfehérvár is to contribute to the realization of the general target for sustainable energy in Hungary (14.65 per cent in 2020) by supporting the increase of the proportion of renewable energy sources in the city of Székesfehérvár (p. 53-65). The city has an Energy Strategy that contains an assessment of the energy situation with its strengths and weaknesses. The city has a district heating system primarily based on fossil fuels (gas). Besides the Energy Strategy, Székesfehérvár has a Master Plan, an Integrated Urban Development Strategy which focuses on how to increase the energy efficiency of public buildings (governmental buildings, schools, public kindergartens, etc.). In Hungary, electricity demand is expected to grow and energy generating facilities are ageing. Therefore, investments are needed for grid improvements and generating capacity. Recently it has been decided to construct two more nuclear power plants.

The Energy Strategy for Székesfehérvár stipulates four key goals in a long-term perspective:

- 1 A shift in the structure of energy sources in Székesfehérvár decreasing the proportion of fossil energy and reducing environmental load. The actual proportion of 0 per cent of renewable heating energy supply should increase to 25 per cent by 2030 in the district heating that plays a key role in the strategy

- 2 Energy retrofitting of buildings with a focus on energy consumption, while improving the efficiency of energy services. By 2020, the local energy consumption should be decreased by a yearly 1 per cent
- 3 The establishment of an innovative local economy could be supported by trading biomass-based green products and technologies, through a build-up of appropriate industrial and innovative knowledge base
- 4 Raising awareness and fostering and forming energy conscious behaviour and thinking

When these objectives are met, the energy structure will change, increasing the proportion of renewable energy, mainly biomass and solar energy but also wind energy and biogas. The Hungarian IMEA partners have written down recommendations for specific steps with regard to implementing the energy strategy:

- Cooperation and continuous discussion between local stakeholders and authorities
- economies of scale should have a priority role
- the energy modernization of the city cannot be deferred
- soft elements like communication campaigns are important
- the municipality is encouraged to finance energy efficiency campaigns and training, and integrate this knowledge in the learning strategy
- working group activities should be strengthened
- further steps towards a clear monitoring system for obtaining proper data need to be taken



Solar panel, Tóváros housing estate, source: Széphő Plc. 2014

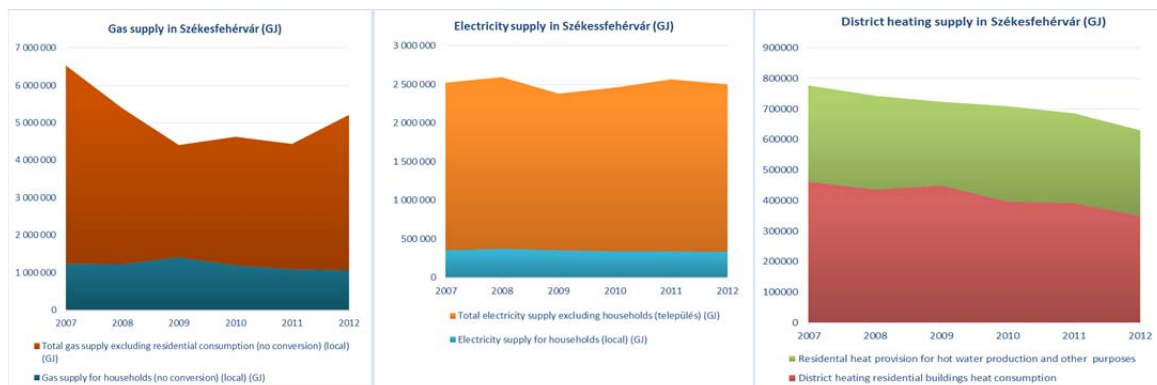
In Székesfehérvár, the difficulty is that the Local Energy Strategy needs to be implemented in a financially resource-poor environment. The 2007-2013 programming period has nearly ended and the new programmes have not yet begun. Therefore, it is logical to start implementation with soft projects that contribute to energy efficiency awareness amongst local stakeholders. Energy efficiency data collection can lead the way in establishing a strong data background for future hard investments. The Hungarian IMEA consorti-

um has approached local and national decision-makers to voice their recommendations, and some results of these efforts are discernible:

- in general, increasing awareness of energy efficiency is noticeable
- energy consumption is continuously decreasing, due to the global economic and financial crisis and to citizens' saving efforts
- national and local funds now make it possible to realize green building retrofitting projects
- Széphő Plc., the local heat provider, has launched an initiative to modernize equipment, primarily boilers. The company used mainly its own financial sources to implement the works

Currently there are no actual initiatives to introduce sustainable energy sources in Székesfehérvár. All over Hungary, biomass is the main sustainable energy component in the share of renewables. The problem is that the energy supply system in Székesfehérvár is gas-based. Although the economic crisis caused a drop in the overall energy consumption, electricity demand is expected to grow in the near future. Generating capacity in the city is ageing, and investments are needed for grid improvements and generating capacity.

Electricity, gas and district heating supply between 2007 and 2012, Székesfehérvár



Source: Teir database, Széphő Plc. 2014

The IMEA partners have decided to focus on the social aspect of the CC, and they are preparing an energy efficiency communication strategy as there is a lack of skills in presenting ideas to the citizens:

“There are numbers, you see figures everywhere. But public administrators and decision-makers shall follow a clear strategy to present their ideas to citizens” (IMEA partner, Hungary).

To raise awareness about energy efficiency issues the IMEA partners now organize special training classes in the schools of Székesfehérvár. The campaign has proved very successful, feedbacks are positive, and more than 300 students have participated. Also the partners have defined some project packages with a number of smaller projects focusing on energy efficiency, which is an innovation in Székesfehérvár. Decision-makers now support the panel programme (which is a major factor in energy savings) and they increasingly mention the planned energy efficiency projects. The greatest limitation remains the lack of financing:

“Via the new Operational Programmes, financial sources will become available to start the long-awaited energy efficiency reconstructions in Székesfehérvár. It is also a positive outcome that after a grant-dependent era, newly created financial instruments will become available in the next programming period. These instruments will enhance both energy efficiency efforts and the financial awareness of citizens as well as companies” (IMEA partner, Hungary).

6. Energy policy can be a driver for regional territorialisation

The “Baixo Carbano” is a partnership between The Directorate for Territorial Development (DGT) and CIMLT, an association of 11 municipalities in the Lezíria do Tejo region that uses an Energy Matrix (TEEM) to support the territorialisation of energy policy at the regional level in Portugal (p. 76-87).

Energy policy in Portugal is a national affair; local governments do not have a formal law behind them on this topic. With this in mind CIMLT facilitates the municipalities’ participation in the Portugal2020 Funding Program, a partnership with the European Commission to bring together the five structural funds and the innovation fund of the EU. Also, CIMLT organises a centralised acquisition process, and coordinates a cooperation model agreed to by all participating municipalities. The energy matrix developed by DGT, is a key mechanism to strengthen the energy policy agenda in the highly diverse region of Lezíria do Tejo. At this moment there is a lack of information about energy-related issues, and therefore a lack of knowledge about where to intervene and invest in energy efficiency, and a lack of knowledge about the regulatory and institutional environment regarding energy efficiency. The TEEM provides an analysis and data-gathering instrument to identify potential collaborative gains, inspire networks and coalition building between stakeholders, and monitor and measure specific energy efficiency steps and improvements.

The Territorial Energy Efficiency Matrix (TEEM)

The Directorate for Territorial Development works to strengthen territorialisation of energy policy in line with national and EU objectives, and it has developed the TEEM to provide a strong basis for a mobilisation of national, regional and local stakeholders in relation to this policy agenda in Portugal. The TEEM has many functions. The TEEM maps energy use and energy efficiency potential, and it allows for analytical cross-referencing between energy-producing and -consuming sectors. The TEEM provides data at a territorial level to enable local policy makers to make better and more informed decisions. It is a basic information system that, when completed, contains all the data of the associated stakeholders covering energy use, energy allocation, funding possibilities, specific energy consumption patterns, involved stakeholders, etc. Baseline indicators show current status and activities in all domains, hereby identifying areas for collaborative advantage and energy efficiency improvement possibilities.



The 'cloud puzzle' representing multi-stakeholder collaboration in the TEEM

Further, the TEEM allows for a more integrated policy at the national level, targeting the Portuguese CIM's within ITI's (EU approach for territorial strategies) to make an energy efficiency approach integral in all energy-related activities. Funding for energy efficiency initiatives is scarce in Portugal, and the TEEM will channel EU funding to the local and regional levels. Essentially, the TEEM is an open source territorial information platform that provides tools to support local agencies' territorial energy efficiency strategies. For example, currently there are 46 Sustainable Energy Action Plans in Portugal, but these focus on more narrow issues pertaining to the individual municipality. The TEEM will provide a framework for identifying energy issues and potential energy efficiency measures common to all local governments at the regional level.

"Sometimes we look at very specific targets but we should look at the energy system if we want to have a good and sound energy efficiency strategy, because there are linkages between the systems. If you look too much at the detail, sometimes the adding up of all the detailed approaches is not providing a sound strategy in the end. There is no point in promoting partial efficiency – we should look at the whole energy cycle and understand where the biggest losses and opportunities for efficiency are. If you look at the whole energy cycle, then you will probably manage to have a systemic approach" (IMEA partner).

From a governance perspective, the TEEM is designed to tackle both horizontal policy integration at the national level, coordination with EU funding, vertical articulation between national, regional, sub-regional and local levels, as well as inter-municipal cooperation. The TEEM promotes a low carbon territorial development model that unlocks underexploited resources and synergies at the local and regional levels in a multi-level integration framework. As such, the TEEM is an open source platform for 'smart city' processes, where local and regional stakeholders share data and exploit collaborative advantage by looking for smarter ways of saving energy and integrating energy solutions across traditional borders between sectors, government bodies and public-private divides. The TEEM pushes for a change in planning culture, away from a traditional approach where one agency solves policy issue for all other agencies, to a relational and hybrid form where multiple stakeholders analyse own stakes and interests in a larger picture (the cloud puzzle) exploiting value creation options individually but also through coalitions that serve the aggregated group of stakeholders.

Territorialisation as change agenda has three distinct and related approaches:

- Integration. Ensuring the climate-change mitigation policy response can work down to the local level, tackling both energy and mobility and transport (low carbon model) within a single strategic programme framework
- Territorialisation. Using energy efficiency policy to evaluate the CIM as the climate-change mitigation policy's territorial coordination agent, providing start-up tools to support the CIM energy organizing activity: Information, strategy, institutional governance, financing, communication
- Space-basing. Providing an open spatial platform for stakeholders to co-operate and share information on energy relevant issues

DGT does not perceive the TEEM as a specific and operational change case, but as a knowledge-sharing platform that supports a change already taking place at the inter-municipal level. The TEEM is an open platform that will provide a push for a cultural and discursive change towards greater co-operation and focus on the local and inter-municipal level in the energy domain. Territorialisation is a very open-ended process, where stakeholders develop relationships over time that fosters both present and future innovation projects and opportunities. The first step is to strengthen CIM as a low carbon and energy policy agency, the next step is that CIM develops local stakeholder networks and coalitions at the territorial scale in relation to energy efficiency issues.

“The matrix is the underlying process that helps people come together and make them realize that they have everything to come together about in relation to the energy efficiency issue at a regional and also a national level” (IMEA partner, Portugal).

“We should reflect on what sort of change we want. Strategic and smart change is what the cc’s are about” (IMEA partner, Portugal)

7. The Change Case Approach works

The IMEA group recognises that structural change cannot be obtained in a 3-year project. The CC approach is a kick-starter that identifies the key mechanisms by which energy efficiency can be structurally implemented in the built environment. To push for the integrated approach, it is necessary to make smarter strategy processes, and the shared experience of the IMEA group is that the CC approach can be instrumental in achieving this. In this perspective, a main output of the IMEA project is the CC methodology itself, catalysing strategy development and implementation of actual and future energy efficiency improvements in the participating cities, and hopefully in other cities as well. More practitioners may potentially be interested and gain from this process, creating positive circles of awareness, implementation strategies and results. The CC approach functions and the critical-friends meetings proved to be an essential step along the process.

Although the CC processes might not deliver the results that were initially expected, the IMEA outcome suggests that more city planners should invest in change cases to produce results in the struggle for sustainable and energy efficient cities.

“It is the same agenda in all change cases. There are so many variables that we have to negotiate and innovate, and it is only when the whole picture gradually falls into place that you can move the whole scheme forward – so there is not one instrument or one tool - it is a combined change effort” (IMEA partner).

"In some cases, it is more of a discursive process, outlining possible next steps, and in other cases it is more operational. There is an obvious difference between how far projects have progressed, but it is a relative notion, as it has very much to do with the starting line, the context for these activities. I think that despite these differences, there is a clear direction and a clear idea in all projects. So I conclude that this CC approach does make sense, it is actually working. It is a necessary mindset and working perspective to mobilise multiple stakeholders to identify joint benefits and try to think about and actually implement integrated projects" (IMEA partner).

Recapitulation and discussion

All IMEA partners faced different problems elaborating their change cases, although these problems were related to similar and well-known barriers. Housing markets, building regulation frameworks and energy systems are very different between the participating countries. Yet, each partner mostly confronted the same barriers, making the transition towards energy efficiency in the built environment a slow process.

The typical barriers are economic in nature: A lack of energy efficiency funding opportunities, a lack of market demand for energy efficiency measures, a lack of funding mechanisms to balance present costs of such measures with medium and long-term benefits.

Others are organisational: A lack of inter-agency coordination, a lack of stakeholder involvement, an insufficient legal and administrative framework for integration of energy efficiency measures.

A common barrier relates to a lack of knowledge: Often there is a lack of technical and practical knowledge related to energy efficiency, and a lack of information about the potential for energy efficiency amongst end-consumers.

The integrated approach needs to overcome barriers to joint decision-making or consensus amongst end-users with respect to energy measures in building renovations. When an apartment block is renovated, it is necessary to convince a high percentage (sometimes all) of owners or renters to invest in energy efficiency measures.

Moreover, in some cities, the integrated perspective on energy efficiency was particularly hard to achieve at the national level, even accounting only for sectors and agencies with direct responsibility within the low-carbon agenda (Energy, Mobility and Transport, Environment).

Coordination between national and local levels is a challenge because it requires a territorial governance structure which is still in the making in most regions, and energy agency responsibilities and resources have yet to be better coordinated.

Essentially, it is a challenge to promote energy efficiency in the built environment. It entails involvement of multiple stakeholders (individual citizens, companies) in combination with high investments costs. On top of this, end-users and citizens are in general reluctant to opt for energy efficiency, experience shows that there is a low sense of urgency surrounding the energy efficiency issue.

To overcome these multiple barriers, IMEA partners focused their strategic approaches in the various fields of activity relevant to their own cities. The strategic CC approach has four key elements:

1. A focused problem analysis of key barriers and potential
2. Concrete actions to meet the basic implementation challenge at different levels to push for actual solutions (a change strategy)
3. Different tools and approaches to mobilise and involve stakeholders at different levels to support and engage actively in the energy efficiency agenda
4. The creation of positive outputs in terms of improved energy efficiency in buildings or in energy systems

The common denominator in all CCs is that the integrated energy efficiency agenda is a critical test of the innovative capacities of the political and administrative systems in the participating European cities: Can these governance systems mobilise both markets and civil societies in the deep transition towards energy efficient or zero energy buildings and renewable energy systems?

Summary of IMEA results

Recognising the complexity of the challenge, the IMEA group used the CC approach to better govern multi-level approaches that are smart, flexible, and strategically tailored to their specific contexts. Specifically, the IMEA group has developed:

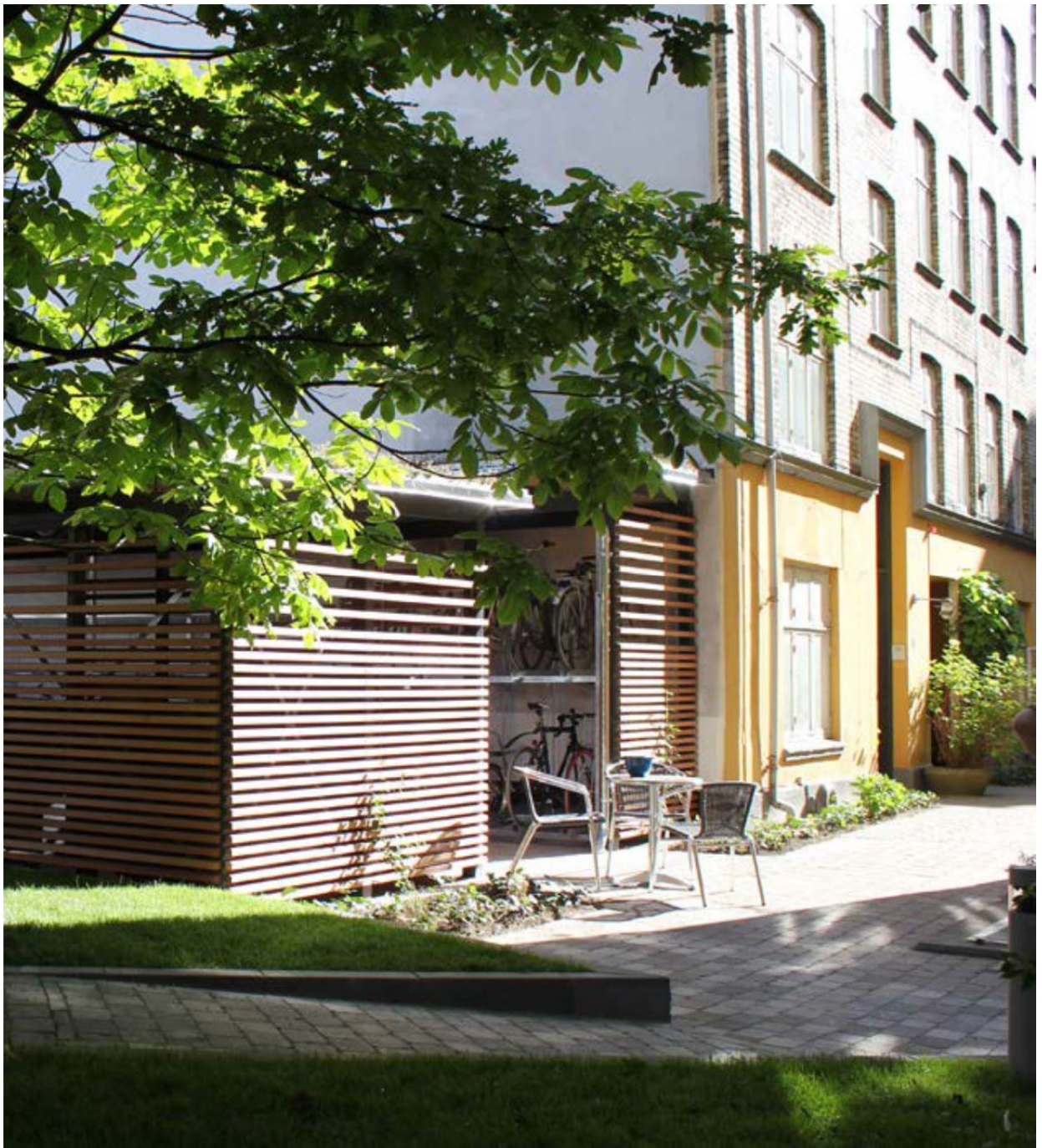
- The area-based approach involving residents in joint actions about energy retrofitting as a key mechanism to implement energy efficiency measures in buildings (Assen, Copenhagen, Oradea);
- The concept of ‘the customer journey’ as an efficient and appealing way that municipality and construction firms communicate with customers about energy benefits (Assen);
- ‘Energy partnerships’ between builders, contractors and construction firms who collaborate about energy efficiency in order to better advise homeowners, improve the quality of their services and to give guarantees on the whole energy efficiency package (Assen, Copenhagen);
- The ‘Fun Lab’, a playful laboratory where children can learn about energy issues (Lisbon);
- New and better ways for local governments to reach residents and local enterprises when communicating about energy issues (Székesfehérvár);
- Mapping methods to register and analyse buildings in terms of refurbishment needs, in combination with social maps of the socio-economic profile of residents in different districts (Oradea, Assen);
- The ‘Energy Matrix’, a knowledge, information and analysis tool specifically developed for energy sustainability diagnostics at the sub-regional level (Lisbon, Lezíria do Tejo);
- The Good Practice Shuttle (see www.savingenergytogether.eu) collects national and international good practice projects in the field of energy efficiency, energy management, and smart planning.

Conclusion

In the period 2012-2015, 10 partners from the Netherlands, Romania, Portugal, Hungary and Denmark engaged in dialogues with local and regional authorities to stimulate the development of proactive governance practices in order to enhance effective implementation of energy efficiency measures in the built environment. On the basis of the evidence put forward in this report, the conclusion is that this effort has largely been successful; IMEA partners have developed and shared innovative knowledge on integrated energy efficiency measures, strategically organised more effective implementation processes, and, with various degrees of success, improved the energy efficiency of the built environment in their cities.

The key mechanism instrumental in this effort is the CC approach that partners have used to make the abstract energy efficiency challenge more tangible, testing various approaches and making multi-actor dialogues regarding institutional, strategic and practical steps more focused. The conclusion is that the CC approach works; it creates a framework for creative institutional learning and 'critical friends' dialogues that empower participants to actually deliver results in the energy efficiency domain.

The IMEA Change Cases



1. The Danish CC: Sustainable urban renewal in Copenhagen

The Urban Design Department, Copenhagen City Council & The Danish Building Research Institute, Aalborg University Copenhagen, November 2014

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The purpose of the Danish Interreg 4C project is to stimulate a proactive public governance practice in Copenhagen City Council that promotes cost-effective energy retrofitting with good architectural standards in private housing in the city region¹.

Climate mitigation and urban renewal in Copenhagen

The vision of the City of Copenhagen is to become the first carbon neutral capital in the world².

Between 2005 and 2015 the goal is to cut emissions by 20 per cent, and then to proceed to become the first carbon neutral "eco-metropolis" in 2025. One of the main goals of the City of Copenhagen is to achieve 10% of its total CO₂ reduction by 2015 through construction and renovation (retrofitting) projects. This is equivalent to 50.000 tonnes of CO₂. Both construction and renovation projects will have to contribute to reducing energy consumption. Energy efficiency in terms of energy savings and use of renewable energy is required in construction and renovation of buildings which the municipality owns, rents or support financially like urban renewal projects.

Copenhagen stretches from the old buildings in the heart of the city to prize-winning modern architecture in the new developed areas. As most Danish cities, the City of Copenhagen has a longstanding tradition of urban renewal, and in the post-war period the city's building stock has undergone a substantial renewal process resulting in relatively high housing standards. Today, about 11 per cent or 33.000 homes of the city's 295.000 housing units are considered to be of inadequate standard, lacking basic amenities as district heating, toilet and/or bath. 4.000 units still have a toilet at the back stairs.

¹ For a more elaborate account of the Danish CC, see Engberg (2014) Negotiating Green Retrofitting Standards in Danish Urban Renewal. *Open House International* Vol 39, No 2.

² Copenhagen City Council: *Copenhagen Climate Plan*, (<http://www.c40cities.org/docs/ccap-copenhagen-030709.pdf>, downloaded 1 December 2010).

Urban renewal

Danish urban renewal is regulated in the Act on Urban Renewal and Urban Development. The act provides a financial subsidy to two types of urban renewal activity: *building* renewal and *area-* based renewal. The subsidy scheme is administered by the local authority, which makes a decision subject to an application from the property owner on whether the owner should be granted building renewal funds and on the size of the funds. Local governments match fund state subsidies with an amount equal to that of the total state subsidy.

In the *building renewal scheme*, subsidies are granted to

- a) Rental properties without up-to-date heating, toilet or bath; or to rental properties built before 1950 which are considerably rundown
- b) Owner-occupied or cooperative properties without up-to-date heating, toilet or bath, or owner-occupied or cooperative properties built before 1950 which are considerably rundown
- c) All properties, regardless year of construction, that energy retrofit according to suggestions in the energy label.

The *area renewal scheme* is a public subsidy for a comprehensive area-intervention in a troubled urban area. Local authorities may apply for subsidies to renew rundown urban areas in large and small cities and in new housing areas with massive social problems. Subsidies can be used to renovate streets, roads and squares, and to start social and cultural activities. Also, local governments receive subsidies for planning, fact-finding and organising when transforming old business and port areas. Subsidies are conditional on the inclusion of local stakeholders in the planning and implementation of the initiative.



Urban renewal in the Urban Design Department

The Urban Design Department (UDD) administers the building renewal scheme, and the department has two key mechanisms by which it can promote energy saving measures in building renewal projects:

1. By supporting applications for renovation subsidies that include energy saving measures, and by issuing recommendations and specific demands in correspondence with the Building Regulations 2015 and the city's norms in the municipal building code so that applicants further develop these measures in order to maximize overall energy savings.
2. By supporting innovative demonstration projects that promote comprehensive and integrated ('smart') energy renovations. Demonstration projects allow for a dialogue with building owners and contractors in the initial phases of project development

In 2009 the Danish Parliament adopted an amendment of the Law on urban renewal and urban development that allows city councils to disregard the eligibility criteria in the building renewal scheme and subsidies energy renovation projects if applicants have energy label reports. Buildings larger than 2.000 m² must have an energy label with information about the energy-related state of the house, and the certificate must recommend specific energy-improving investments.

"At our Critical Friends meeting with the municipality of Assen I was introduced to methods of selecting areas for energy retrofitting. In Assen they use "Energy scan of the house" that shows areas or groups to focus on. It is formed as a map that shows types of homes and demographic characteristics put up against energy and financial data. We use a similar method with socio-economic maps for when we in Copenhagen pick areas for area-based renewals, but have never combined it with energy. The Assen approach was an eye-opener for me. Their methods is an inspiration, I can now see a way of involving our Climate Department to conceptualize the total urban renewal program including the area-based approaches as a tool for their climate plan"(urban planner, City of Copenhagen).

At the same time (2009) the Copenhagen City Council adopted a new strategy on sustainable urban renewal which has a main focus on integrating energy efficient solutions in renovation projects. In order to achieve the objectives of the strategy and the Climate Plan the city claims energy label reports as a part of every application. This allows the city to formulate appropriate requirements for energy efficiency improvement measures in future urban renewal projects.



7 innovation tracks and a new strategy for sustainable urban renewal

The building renewal scheme is based on the voluntary participation of house owners, and it is generally difficult to make these owners accept cost-effective energy measures when these measures imply extra initial costs in the project. It follows, that there is a general need to stimulate the demand for smart energy renovations in private housing in Copenhagen. The key barrier in this process is that the city administration cannot assist building owners in developing renovation projects and –applications to avoid positive discrimination of applicants, who should be treated equal before the law. The consequences are that

- a) projects do not benefit from current knowledge concerning technical and architectural solutions in the domain of comprehensive energy efficient retrofitting
- b) that planners cannot stimulate owners' preferences in relation to energy measures to any satisfactory degree
- c) that the general effort to promote energy measures takes place AFTER renovation projects have been formulated and presented to the City Council

UDD identifies a clear need to develop a new "food chain" in relation to building renewal in Copenhagen to create innovations in the building renovation scheme that allows for a proactive municipal role in building renovations and a general push for a greater public demand for smart energy renovations. To reach this 7 innovation tracks will be developed as the key drivers towards this goal. The core challenge in the Danish change case is to stimulate innovations in each track and to achieve 'cross-fertilization' or synergy between the innovation tracks to maximize implementation effects.

Track 1: Proactive administration that improves EE in all urban renewal projects

Administratively, the city can either accept or refuse to fund building renovation projects. This practice is reactive in the sense that the city is dependent upon the incoming flow of applications; it can only choose between these, it has no say with respect to the actual content of projects.

To change our administration UDD have developed a new and proactive process where architects from the municipality initiate a dialogue with future applicants before they submit an application. This way there is an earlier involvement in the project phase and due to this the department have in 2014 received 130 applications (earlier we had only 60) and 90% of the applications contain energy improvements.

Track 2: Synergy between EE and architectural norms and standards

Architecture and climate mitigation sometimes conflict if smart energy renovation measures are incompatible with safeguarding the architectural qualities of existing buildings. This potential conflict is an everyday challenge for architects in the Urban Design Department (UDD) when they work to promote the climate agenda while safeguarding the City of Copenhagen's architectural heritage. Energy measures have to be smart in relation to both energy efficiency and architectural standards in a sustainable renovation practice. UDD recognizes the need for developing new synergies between preservation and renewal, and wishes to strengthen the professional dialogue and integration between these different professional considerations and practices.

The IMEA- project has contributed to an elaboration of best practice guidelines. UDD have therefore formed “Urban renewal as green laboratory”. This is a debating platform with its own newsletter and network of producers of EE-products, researchers on the field of EE and practitioners/ architects from the private and public sector. On this platform specific EE renovations divided into building parts or themes are “put under the microscope” in order to create an impact on future EE renovations and develop mechanisms that stimulate the demand for integrated and cost-effective energy measures. The department has by end of 2014 developed 14 demonstration projects, and uses these more offensively to promote smart energy renovations in the city and in the region.

Track 3: Innovative EE-partnerships and more value from demonstration projects

The individual renovation project is complex and the challenge is to promote general guidelines and recommendations or demands that set new high standards *and* target the specific conditions of individual projects in steering dialogues with private contractors. This entails a high level of technical and architectural expertise that needs to be developed and tested in specific projects in collaboration between owners, contractors, producers of EE-products and the municipality. The city therefore emphasizes the need to develop new EE-partnerships with building owners, contractors and citizens to test and demonstrate innovative energy renovation projects.

In 2013 the department has entered a partnership with the main energy provider in Copenhagen and hereby accessed knowledge about energy consumption in specific buildings that apply for subsidies. The energy provider produces a thorough energy report that puts an emphasis on a more energy efficient retrofitting and strengthens the dialogue with building owners. After a renovation the energy provider makes a remote monitoring and follows the energy consumption in order to report the actual energy saving as a result of the renovation.

In 2012 UDD started a demonstration project that contains a whole block of buildings with 14 different owners: “The Climate block”. The aim of the project is to link producers of EE-products with practitioners/advisors and the 14 building owners. A lot of products are ready to be tested and advisors show a great interest in participating in the development of new type of energy renovation.

Track 4: Improved horizontal collaboration and citizens' participation

The City of Copenhagen has several departments involved in climate adaptation and the promotion of EE in the built environment. In UDD different planning units work with different approaches to citizens' participation in urban renewal. To promote integrated approaches to EE there is a general need for better administrative coordination of existing programmes that target sustainable urban renewal and development. Further, there is a need to develop proactive measures that stimulate public demand for smart energy renovations.

To make a better administrative coordination and collaboration UDD needs to produce a common understanding or approach of the areas we pick to work in. On our Critical Friends meeting with the municipality of Assen we were introduced to methods of selecting areas for energy retrofitting. As an example, in Assen they use “Energy scan of the house” that showing areas or groups to focus on. It is formed as a map that shows types of homes and demographic characteristics put up against energy and financial data. We use a similar method for when we in Copenhagen pick areas for area-based

renewal, but have never combined it with energy. At the moment we are working on the involving the Climate department in producing such a map.

Track 5: Testing and developing the EE-strategy in area-based approaches

The complexity of the IMEA challenge needs to be addressed in comprehensive area-based approaches.

As a result UDD has identified a specific urban renewal area in “Sydhavnen” (South Harbour) and this area will be used as a test-case for the development of a new proactive approach to sustainable urban renewal. One of the criteria for choosing this area is that it has the 2nd highest energy consumption in Copenhagen. The comprehensive approach will involve a climate partnership with the main energy provider in Copenhagen, involvement of local stakeholders, sustainable energy projects, information campaigns, mapping of co2 reduction potentials, rainwater collection measures, demonstration projects etc. The area-based approach is intended to promote local ownership to energy projects, and also influence citizens' energy consumption patterns and on the long run give the area a new “green” identity.

Track 6: Benchmarking EE-results in urban renewal

Better tools for mapping and benchmarking actual CO2 reductions and the costs associated with these need to be developed, and systems like LEED, BREEAM and DGNB need to be considered in this respect.

In 2014 UDD has developed a digital platform for applicants who apply for subsidies. Through this platform we will get more energy measures showing cases “before” and “after” renewal. This gives us an opportunity for a more focused evaluation of the actual “after” renewal measures.

Track 7: A new strategy for sustainable urban renewal

The outcome of the seven innovation tracks will inform the new strategy for sustainable urban renewal to be adopted by the City Council in 2014. The strategy will reflect and support the administration practice in urban renewal with a focus on customers' preferences, value creation, outcome evaluations and collaborative innovations.

As it turned out, the city administration decided not to formulate a new Copenhagen Strategy for Sustainable Urban Renewal 2014-17, and the UDD decided to push for specific innovation activities in green retrofitting, strengthening its administrative standards instead. The new administrative foundation has an increased focus on:

- Promotion of climate mitigations and energy saving solutions
- Better linkage between urban renewal actions and strategic development of the city
- A closer linkage to other public or private investments to achieve maximum synergy and permanent effect
- A larger flexibility in the use of urban renewal funds so that they reflect the need of the citizens and the city.

The main improvements are:

- 1 Promotion and implementation of climate mitigation measures and energy in urban renewal projects, allowing for the existence of toilets outside of apartments (until now the municipality of Copenhagen automatically prioritized resources for moving toilets inside apartments)
- 2 A flexible fund for establishing bathrooms in apartments where the inhabitants want it and a preparation of the remaining apartments for future rehabilitation (until now the municipality has established bathrooms in all

apartments as an eligibility requirement for property owners to access the urban renewal subsidy

- 3 Prioritization of projects that can result in greater energy savings. In larger projects involving more than three building parts, the aim is to implement energy initiatives, which means that the property in the future will a) Have an energy consumption equivalent to energy label C or b) Reduce heating consumption with a min. of 20 % for buildings with a high SAVE value/ preservation value or c) Reduce heating consumption with a min. of 30 % for buildings with a low SAVE value/ preservation value.

Vision of change strategy: Sustainable urban renewal in Copenhagen

The purpose of the Danish Interreg 4C project is to stimulate a proactive public governance practice in Copenhagen City Council that promotes cost-effective energy retrofitting with good architectural standards in private housing in the city region. Considering the main barriers in the existing administrative regime in Copenhagen, there is a need for a multi-level innovation process that addresses and develops strategic and practical responses to these barriers. This multi-level innovation process we describe as a "change strategy", which is the focus of the Danish project. The essence of the change strategy is to develop the seven innovation tracks and integrate these in a new administrative foundation and a new proactive administrative platform.

The administrative platform is in the first half of 2014 formalized into a recommendation to be politically decided in 2015 as well as a number of specific administrative innovations (processes, concepts, guides, networks etc.). A specific area-based urban renovation project ("The Climate Block") acts as laboratory for the development of some of these new measures including the green growth approach in City of Copenhagen. Also a specific area based approach in "Sydhavnen" focuses on EE on a district level.



Copenhagen, exterior insulation and new balconies

Bench-marks and expected outcomes

In the spring of 2014 indicators and benchmarks in the 8 innovation tracks have been identified by city professionals and private commercial and non-commercial partners.

SWOT

The following is a preliminary SWOT-analysis made in the second half of 2012.

Strengths	<ul style="list-style-type: none">Strong societal demand for EE-solutions in practiceClear and operational innovation agenda
	<ul style="list-style-type: none">Political and administrative support to project agendaIMEA supports local change processes
Weaknesses	<ul style="list-style-type: none">Change case & innovation tracks top-down formulations, not yet anchored in UDDBudget-limitations will hamper end resultsCosts may not outweigh tangible benefits in practice
Opportunities	<ul style="list-style-type: none">Revision of SUR necessitates institutional learning and innovationStrong motivation in UDD regarding climate- and EE agendaIntegrated value creation boost to urban renewal
Threats	<ul style="list-style-type: none">That professionals reject EE-agendaThat proactive ambition will failThat new strategy will not be implementedThat UDD will not deliver towards Copenhagen's climate goals

2. The Change Case of Székesfehérvár (2020)

Széphő, Mid-Pannon, VATI

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Baseline analysis: Context and nature of challenge

In spite of the fact that the Renewable Energy Directive (RED) of the European Parliament and of the Council determined a 13 percent minimum rate of renewable energy for Hungary in gross final energy consumption by 2020, the Government took a pioneering role and set this target to 14.65 percent for the same time-period. This commitment was built in the national strategies. To achieve the objective the rate of renewable energy has to be increased in the big cities, which are the main consumers of energy.

The Mid-Term Energy Strategy of Székesfehérvár (Energy Strategy, Strategy) was developed with the intention of lowering environmental risks and to achieve a more sustainable energy-management. The elaboration of this document was not a legal obligation, but the city decided to take advantage of a greener energy provision and structure, thus better contributing to achieve the Government's targets. The documents objectives fit the climate and energy policy aims of the EU2020 growth strategy, and the RED directives of the European Council and Parliament. It takes the guidance of the National Energy Strategy 2030 document into account, and follows the Hungary Renewable Energy Action Plan (NAP), and Second National Energy Efficiency Action Plan as well.

The Hungarian IMEA Change Case was elaborated with the aims of better **promoting and enhancing the objectives** and the methods of the **Energy Strategy of Székesfehérvár**. The document shall provide guidance in the reduction of the pollutant emission, fine-tune the plan document dealing with energy efficiency, and define the exact steps of the implementation as well, where public participation plays a particularly important role. Currently, the proportion of the renewable energy within the total energy production is quite low in Székesfehérvár. There have not been precise surveys conducted, but looking at public institutions such as schools or local government institutions, this rate is close to zero. The lack of green energy consumption points out the fact that green and carbon-free investments have to be strongly supported and subsidized not just in the public sector, but also in the private area. In the last decade, the available green technologies became significantly more affordable which already triggered the private investments: photovoltaic and solar collectors, geothermal solutions and different types of biomass processing came to the fore increasingly. This process can be considered as

the first steps of a long-term process, but still, the regulatory environment and market incentives must be further fine-tuned and extended.

In parallel with the relevant Hungarian and EU strategies, the Hungarian Change Case puts special focus on supporting Székesfehérvár in reaching the commitments on renewable energy usage (14.65%). Beside this aim, the overall energy efficiency of the city must be notably increased, as a further important goal.

Since district heating (combined with hot water provision) is the most common way of heating in the city, it was clear from the initial phase of the change case that the modernisation of heating systems and thermal insulation are the most efficient measures that can contribute to the reduction of energy consumption. In order to reach better efficiency, not only “hard” investments, but also “soft” projects were taken into consideration. Thus, the Hungarian IMEA consortium involved awareness raising aspects completing the Energy Strategy’s intervention toolkit. These interventions shall be included within integrated projects (soft and hard) in order to reach better efficiency.

Objectives of the Change Case

- I. Determine relevant projects on Energy Efficiency, which contribute to achieve the following aims:
 - a. Increase the proportion of the renewable energy in Székesfehérvár by 5%
 - b. Encourage the soft aspects of integrated projects dealing with energy efficiency
 - I. “Hard” projects e.g. thermal insulation
 - II. “Soft” projects – awareness raising
- II. Based on the accumulated experiences, give recommendation for the local government to prepare its action plan for the next implementation period of the Energy Strategy / whole Urban Development Strategy 2014-2020

As a starting point of the development process, the existing strategies must be taken into consideration during the assignment of the main trends. To achieve the designated objectives and to accomplish projects related to the utilization of renewable energy and energy efficiency, a local energy strategy was needed. The Széphő Plc was in charge, entrusted by the Municipality, to elaborate this document by the end of 2012. From that time, it became the main policy document in tackling with green energy and energy efficiency issues in Székesfehérvár. The Strategy outlined the importance of use and supply of green energy at institutions and companies of the municipality produced by state of art technologies.

During the assessment of this strategy, **a market gap was addressed**: the lack of stakeholder involvement meant a breaking force in the implementation. The gap-analysis was conducted by Széphő Plc. within the framework of the IMEA project. In order to fill the revealed gap, the company has launched a bottom-up initiative: a completion process was launched on involving stakeholders in the due revision of the Energy Strategy. Government companies, newly involved stakeholders worked together to fine-tune the planning document. As a result, local energy investments are on the way, thus the projects can parlay the best of the local developmental potentials, avoiding building parallel capacities and wasting resources. The Strategy has to serve as a guideline for the companies who plan developments in the

area of energy efficiency, especially renewable energy. The aim is to generate more and better projects focused on carbon-free solutions.

Contribution to the targets, the Hungarian IMEA partnership compile more information about the potential projects involving national and also international good practices collected within the framework of the project's 3rd component. Generally, wider knowledge of public sector plans is already available; however, it is also important to analyse and stimulate energy efficiency investments not in the private sector. Since the economic crisis had devastating economic effects on the private sector, cost efficiency became a main priority, thus fewer companies have the financial source to deal with energy efficiency. A precisely focused communication campaign can highlight the long-term positive effects to enterprises showing how these investments can contribute to a more profiting and financially more sustainable economic status. Besides communication, the coordinating authorities shall put focus on financing solutions. The new Environmental and Energy Efficiency Operational Programme and/or JEREMIE (Joint European Resources for Micro to medium Enterprises) sources from other programmes are going to provide solutions for these credit barriers. Experienced project managers and prepared consultants will have a determining role in these awareness campaigns.

Partners within the Hungarian Consortium of the IMEA project

The Hungarian consortium of the IMEA Project was established in the beginning of 2012. Their priority task is to elaborate the change case of Székesfehérvár. This document will provide recommendation and guidance for the Municipality on how they can enhance the effectiveness of the local Energy Strategy. Partners are the following companies:

- Széphő Plc. (the main supplier of district heating in the City), as an external consultant. They provide knowledge about the projects with energy efficiency and green technology background; initiate projects on this area
- Mid-Pannon Plc. as the partner responsible for developing and facilitating exact projects that can contribute to reach the energy efficiency targets;
- Lechner Lajos Knowledge Center (former VÁTI Non-profit Ltd.), who provides policy recommendations from the country-level, and also tries to enforce these recommendations at national-level policy making.

Change strategy, learning agenda and key drivers

The approved Energy Strategy has a medium-term (7-8 years) development plan, which serves as commitment, target and tool in the same time. It proves that the city is committed to modern energy management. The change case determines all strategic directions towards energy efficiency that shall reflect the aims of the Energy Strategy.

The existing market demands for investments and developments have to be handled as a complex system, and thereby the change case should provide instruction on planning and coordinating those projects. **The Hungarian case strongly recommends cooperation and continuous discussion between local stakeholders and authorities** in order to prevent isolated project implementation that are currently being realized. Integrated projects must be supported where **economies of scale should have a priority role**.

The guideline for the local government is clear: **the energetical modernization of the city cannot be deferred**. Future developments must focus on the modernization of the public owned district heating system, and insulation project shall be further subsidized. Block of flats cover a large share of **residential houses** where the owners **often have limited financial sources to tackle alone with refurbishments**. Government interventions shall lead the changing process where financial problems cause inability in acts.

The vision of the city towards energy efficiency

The Municipality has laid out a competitive long-term energy vision for Székesfehérvár in which **an innovative, energetically modernized city hosts a competitive economy that provides sustainable environment** by a complex energy management system. Renewable energy sources and carbon-natural smart solutions play a key role, and green consciousness among the citizen is not just an obligation, but also profitable way of planning and thinking.

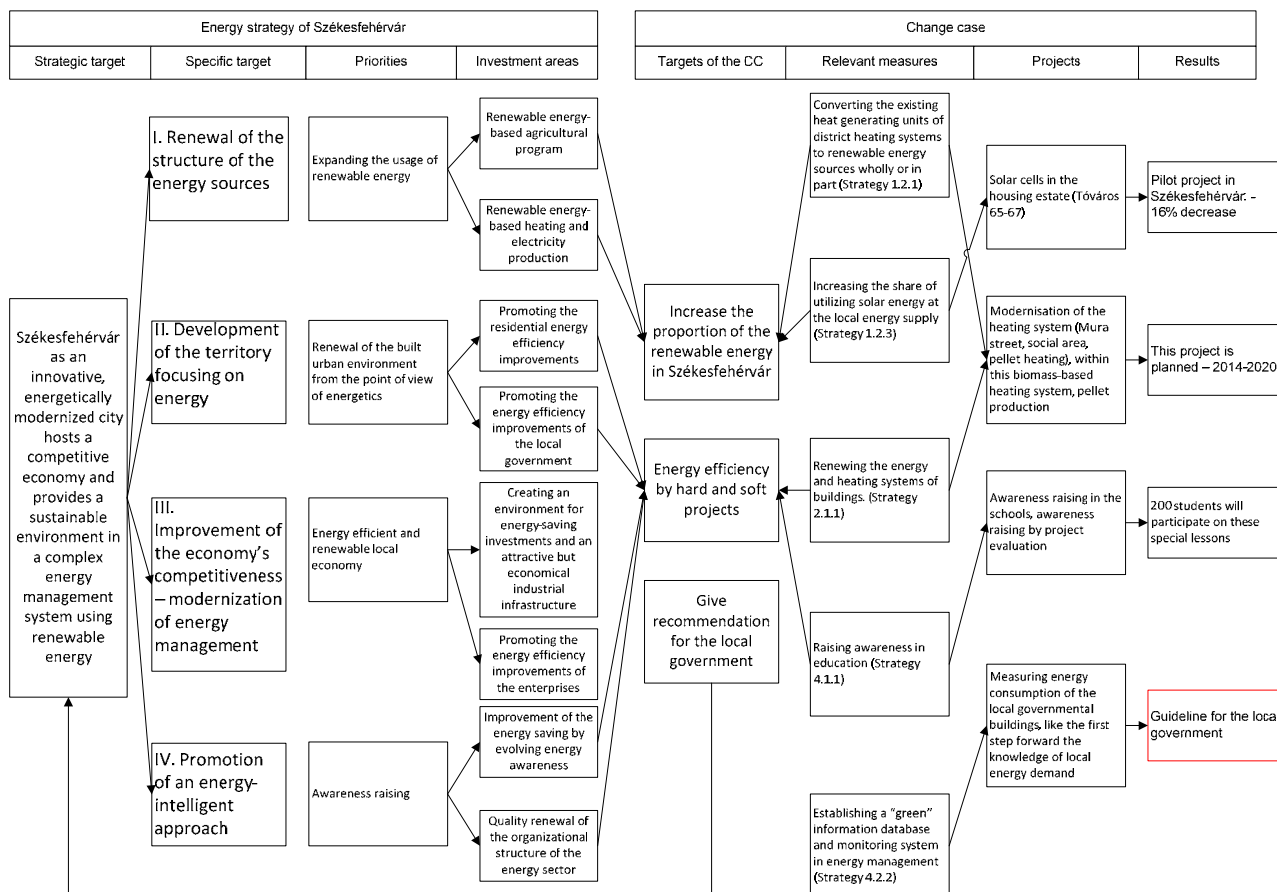
According to this vision, the following steps have been defined:

- The Local Government of Székesfehérvár shifts the city's energetic structure and energy supply systems by discovering and using renewable energy.
- The environment shall be sustainably used by emphasizing the economic and environmental energy management aspects in which the energy efficiency and energy savings are prioritized.
- The Local Government creates and contributes to a more secure and sustainable living condition for citizens by increasing the environmental and energy security.
- The city involves state of art green technologies changing to stabilize financial resources; promotes environment friendly industries and innovative technologies by regulatory relief and subsidization where it is necessary.
- Székesfehérvár must keep its regional energy provider function in a close cooperation with its near and wider surroundings.

The Energy Strategy has already identified the necessary measures based on the energy potentials and demands in the city and in its agglomeration. From these already addressed 24 measures the following priorities are summarized and promoted by the Change Case:

- I. Renewal of the structure of energy sources
- II. Overall territorial development by sustainable solutions
- III. Improvement of the economic competitiveness – modernization of energy management
- IV. Promotion of energy-intelligent and smart approaches

The Hungarian IMEA partnership elaborated a structural table in which the relationship between the strategy and the change case is clarified. Future energy-efficiency projects took a priority role where the change case provides guidance for the local government and for the citizens as well:

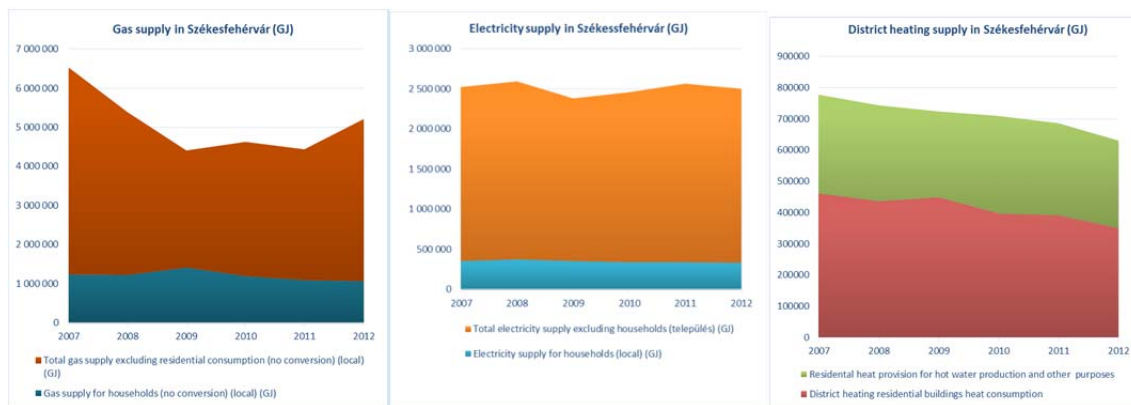


1. Figure Connection between the Energy Strategy of Székesfehérvár and the Hungarian IMEA Change Case. Source: Széphő Plc. 2014

Change in the energy structure

As a main challenge of becoming a green and carbon natural city, Székesfehérvár defined the exact steps of changing its energy structure via the following steps:

- 1 Decrease the proportion of fossil energy (the current Energy Strategy details the potential exploitable renewable sources: biomass, solar and wind energy)
- 2 The energetic renewal of the buildings (thermal insulation, heating modernization). By 2020 the local energy consumption should be decreased by 6% compared to 2014.
- 3 The establishment of an innovative local economy could be supported by trading biomass-based green products and technologies and building up appropriate industrial and innovative knowledge base.
- 4 Fostering energy consciousness



2. Figure Change in the energy supply, Székesfehérvár, 2007-2012

Source: Teir database, Széphő Plc. 2014

Specific measures and recommendations

Specific targets were identified within the new local Energy Strategy, which contribute to achieve the national and EU aims. Ten project proposals have already been collected, but the Change Case recommends the Municipality considering the IMEA component 3 achievements. The discovered national and international projects give advanced recommendations and ideas on project elaboration:

- Portuguese smart energy-consumption measuring techniques in residential use.
- Insulation techniques from Assen, Netherlands.
- The carbon-free city of Copenhagen
- Building heritage renewal involving green solutions from Oradea, Romania
- Green investment projects from Pannonhalma, Hungary
- Hungarian soft projects: schools' illumination programme, virtual power plant, joint-financed building renewal –Village house project, Budapest

In order to reach a better efficiency regarding project implementation, **soft elements must be taken into consideration: communicational campaigns shall lead the process**, where communication tools, such as city lights, press releases, digital newsletters, radio advertisements can increase the positive effect.

During the IMEA project implementation, a Hungarian-Portuguese critical friends meeting was held in order to analyse the common elements and identify the gaps. The Portuguese partner strongly recommended a communicational plan for the Energy Strategy, where target groups are clearly set, and their habits are properly measured.

The following projects are under implementation:

- Solar cells in the Tóváros 65-67 - housing estate ;
- Modernisation of the heating system (Mura street, social area, pellet heating, pellet production);
- Awareness raising in the schools on environmental sustainability and protection, green technologies;
- Measuring energy consumption of the local governmental buildings, as a base data towards further project planning;
- Energetic modernization of municipal buildings:
 - Modernization of city-hall

- Modernization of the swimming pool
- Renovation of Tiszti Klub (Officers Club) building
- Energetic modernization of Community Centres
- Energy efficient increase of public lighting
- Relocation of thermal power plant from Királyisor
- Overall renewal of local energy production and services
- Sustainable development of local traffic

The Tóváros pilot project was completed in August 2013, thus first results are already available:

2013				
	Sept	Oct	Nov	Dec
Proportion of heat produced by solar collector	24,0%	11,6%	5,6%	2,8%

3. Figure: Heat production of solar collector from total heat consumption at Tóváros housing estate, 2013. Source: Széphő Plc. 2014

	2014								Average
	Jan	Feb	Mar	Apr	May	June	July	Aug	
Proportion of heat produced by solar collector	1,80%	3,00%	20,60%	15,90%	23,50%	32,10%	35,90%	36,10%	16,10%

4. Figure: Heat production of solar collector from total heat consumption at Tóváros housing estate, 2014. Source: Széphő Plc. 2014

However in 2014, the number of hours of sunshine has not reached the average, the investment still produced a significant amount of energy. The results made the project convincing, and gave boost for further investments at different locations. Flat owners are experiencing the exact benefit of the new technology, hence they must play a role in communication campaigns.



5. Figure: Solar collector at Tóváros housing estate, 2014. Source: Széphő Plc. 2014

The final success of this technology investment much depends on not just the energy production, but also the capitalisation of project results among citizens. Awareness rising shall play a key role in this project and at the overall communication of the Energy Strategy as well. Among the target groups, children from local schools and kindergarten act as the main target groups. The Consortium suggests that regular training and information provision on energy, energy efficiency and also green issues must be provided for them. In their early ages, children are much more open-minded for novelties, and new information and their expedient education could have longer-term results.

Széphő Plc. as an external consultant and partner of the IMEA consortium has started giving special lessons in the schools: They contacted the secondary grammar schools in Székesfehérvár and offered them basic themes:

- 1 Renewable energy
- 2 District heating
- 3 Overall energetics
- 4 Energy efficiency
- 5 Nuclear energy – potentials and dangers

The following pictures were taken on one of these lessons:



6. Figure: Energy Efficiency lessons for students
Source: Széphő Plc. 2014

Experts gave presentations about the selected theme in the schools on which they got information about the degree of efficiency, heat pump technologies, sustainability, environmental protection, etc. This campaign proved to be very successful, and the feedbacks were positive. More than 300 students participated on these lessons. However, it should also be noted that these campaigns need to be built in the teaching strategy. Losing continuity means that only some of the age groups have been reached, while others

will be left out. **The Municipality is recommended to find a solution on financing these lessons, and build this knowledge into the learning strategy.** It is also important to launch information campaigns among other target groups such as residents of housing estates, or public/private owned enterprises.

Financing energy efficiency investments

In the 2007-2013 programming period, the Environment and Energy Operational Programme was developed to provide notable sources for energy efficiency and green energy developments. As for the new 2014-2020 period the Environment and Energy Efficiency Operational Programme will take over the responsibility on this field. Since the planning of the programme is not yet finished, the exact amount of available sources is hardly predictable, although, it is already known that major EE investments will and shall be based on these funds as main sources of the potential investments.

Regarding small and medium size enterprises (SMEs), further challenges were discovered. In Hungary, at the beginning of the 2007-2013 period, the micro finance sector (firms with less than 10 employees) was under-developed: 14% of SMEs in EU15 countries had problems accessing finance, while in Hungary the rate was 27% in 2005. Only 54% of Hungarian SMEs relied on banks for financing, while 79% did so in EU15 countries. The relatively high levels of transaction costs usually keep away the domestic banking system from handling these small credit requirements of micro enterprises.

Providing solutions for this barrier, the government involved the JEREMIE funds in the 2007-2013 period. These sources were available through the Economic Development Programme and the Central Hungary Regional Operational Programme. From 2014, these sources will be available via the Economic and Innovation Operational Programme. It is also important that these funds will be available for SMEs via re-investable financial instruments, and the rest of them will not contain grant part.

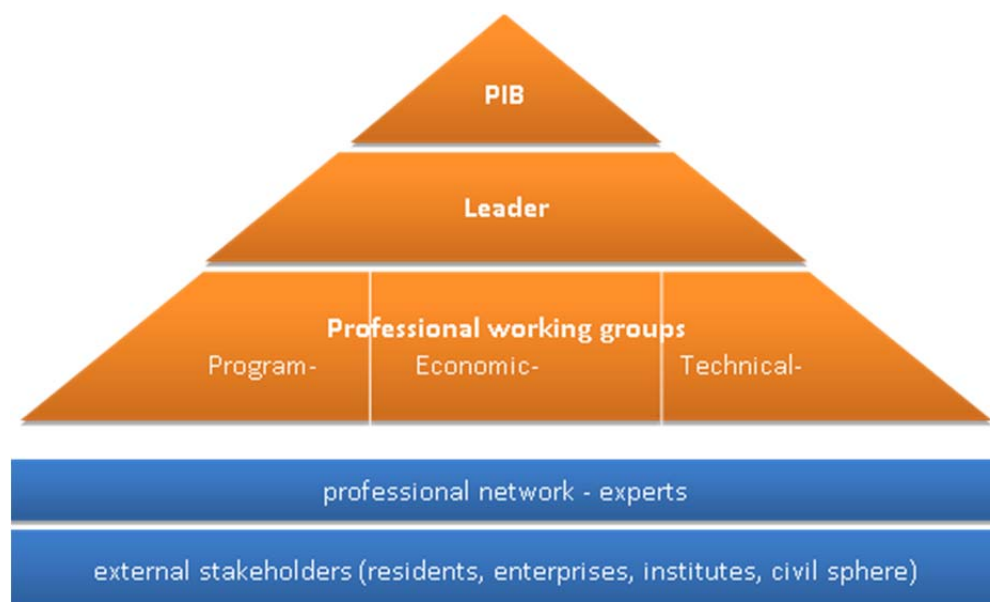
In a grant-, and aid-dependent market environment, these funds can provide financial solutions for the local SMEs to realize their energy efficiency investment.

Other than EU funds, ESCO investments could contribute to the realization of the project. An Energy Services Company (ESCO) is a commercial business that “will identify and evaluate energy saving opportunities and then recommend a package of improvements to be paid for through savings”. Performance contracting with an ESCO can provide an outstandingly efficient tool for a company with energy saving opportunities but no upfront cash or financing options to implement the projects. Usually, one-stop shop system provides energy opportunity identification, quantification, financing, implementation, staff training and a guarantee that the savings will cover the costs of the project.

Consultation with local stakeholders

The strategy was elaborated through a cooperation of working groups. Group-members were chosen from Municipality, the Széphő Plc, and from private experts as well. These teams were responsible for analysing man-

agement, economic and technological aspects of the Energy Strategy, and provided recommendation on how to further develop the document. In general, the local government was assigned as decision-maker and managing authority. Private participants were those experts who have relevant professional experience on the given fields. During the development of the document residents' and the civil sphere's opinions were also collected. The structure of the working group is the following:



7. Figure Source: Heat production of solar collector from total heat consumption at Tóváros housing estate (PIB (HU) = Project Implementation Unit), 2014
Source: Széphő Plc. 2014

As part of the IMAE project, **the Hungarian consortium has renewed these working groups**. Their cooperation was important to achieve the objectives of both the Change Case and the Energy Strategy. Consultations are conducted via workshops where all the participants express their opinion in a constructive manner in order to bridge the gap between the public and private sectors. Private participants provide information on their investments, results and plans, whereby the higher level of the managing authority will be able to consider the inputs during the Strategy revision. **Meetings are scheduled regularly**, at least four times in a year. Participants also keep contacts via e-mail on a daily basis. This cooperation increases the mutual benefits of all partners since the private enterprises will have a better overview on the government's needs, thus their projects will become more relevant during the tendering. As a result, **a specific business model will also be elaborated** which shall be connected to the realization of the Energy Strategy.

The following companies are involved within the new working groups:

- Municipality of Székesfehérvár
- Széphő Plc.
- Depónia Ltd.
- Városgondokság Ltd.
- Fejérwater Ltd.
- Fejér County Chamber of Commerce



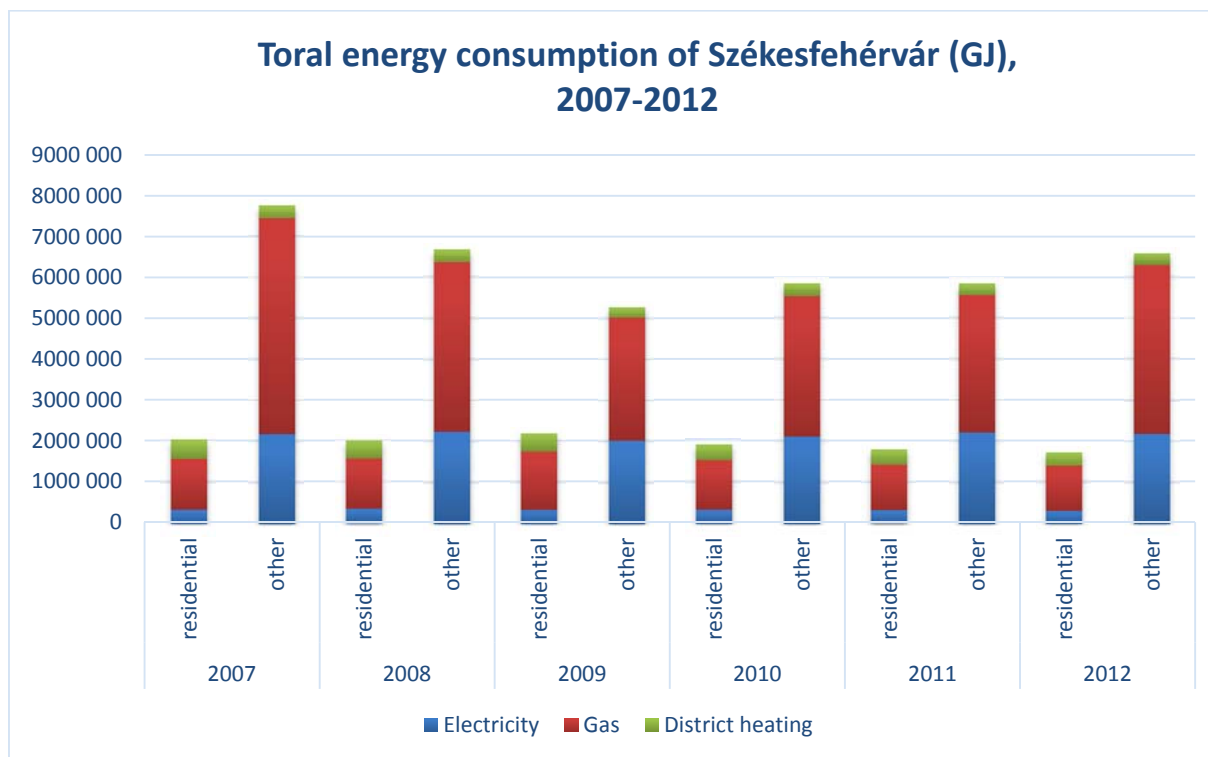
8. Figure: Working group meeting, 2014. Source: Széphő Plc. 2014

Benchmarks and expected outcomes

Specific **benchmarks were defined** based on the results of the second point of Change strategy, namely:

- the number of energy efficiency project are being realised,
- the number of students participated in the EE lessons,
- decreased energy consumption –houses, flats, enterprises (W),
- number of communication materials disseminated,
- percentage of renewable energy consumption at public institutions,
- one elaborated business model.

Via monitoring of these indicators, the Strategy's implementation becomes clearly traceable in order to see if the project requirements are being met. This monitoring system should not only be able to monitor energy savings, but also the expenditure decreases due to EE projects.

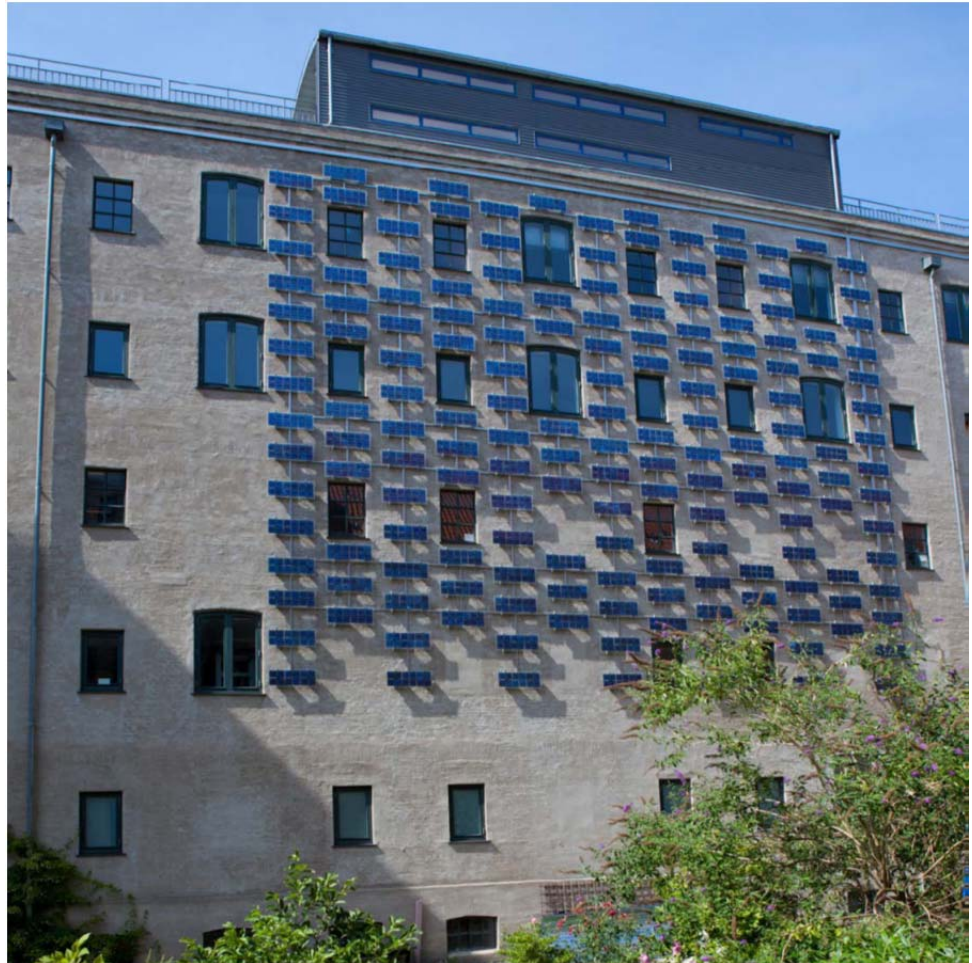


9. Figure: Energy consumption of Székesfehérvár (GJ), 2007-2012
Source: Teir database, 2014

The elaboration of the monitoring system is delayed due to the complications of data collection. Although, there were meetings held on how enterprises and citizens could contribute to the data provision. **The Municipality shall take into consideration that a local database must be developed in order to collect and provide relevant data on green energy.**

SWOT analysis

Strengths	Weaknesses
Local energy infrastructure is in better shape than the Hungary average.	Low share of agricultural areas as main source of biomass; Forest coverage is low; Limited knowledge on energy efficiency issues at all level.
The modernization of the district heating system has increased the energy efficiency and serves as a basis for the future developments.	The share of renewable energy is low; Renewable energy is not used in district heating.
National government provides financial sources for EE developments via Operational Programmes.	Lack of a local energy organization; Lack of monitoring system.
Opportunities	Threats
The government is committed to increase the share of renewable energy especially in district heating; Cooperation can evolve which can ensure efficient energy supply; The theoretic share of renewable energy usage can be increased to a higher level than national average.	Different interests of the different groups, lobby can lead to conflicts; Lack of private financial capital; Local, small-scale projects are being implemented, instead of integrated projects.



3. Change Case “Duurzaam wonen” (Sustainable living)

Municipality of Assen, February 2014

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Key problem

The challenge for the city of Assen is to reach a 50% share of buildings in the existing building stock with an energy label of at least 'C'. To reach the target of 50% of the building stock (about 30.000 houses) at energy label C, an estimated total of 50 million euros is needed. It is obvious that the municipal (or any other) government will not be able to provide this kind of money. Moreover, strategies are needed to convince groups of private homeowners to take measures for energy efficiency improvement.

Main objective

After 2014, 50% of the existing building stock in the municipality of Assen should have an energy label of at least 'C'.

Outline of the strategy to be developed

In general, to scale up present activities on energy efficiency improvement as to reach the number of renovated houses, cooperation between all actors involved is needed. Cooperation between departments of local government to maximize the impact of measures. Value chain integration with parties involved in the renovation process to minimize fallout. And cooperation between governments on all levels to make the process as easy as possible for the homeowner. This strategy can be divided into four pillars:

Value chain integration

Integrating different actors in the value chain will secure a better proposal to the consumer, bringing costs and benefits together at the same decision point. Market innovation is needed: one-stop shopping offers provided by consortia of actors are created. Financial engineering is the biggest challenge: how do we align costs in the first year with benefits over the years after the improvement measures?

Horizontal cooperation

An area-based approach, combining measures from different task fields in the municipality on one location, has proven to be very effective in activating private homeowners to invest in renovation measures. Area-based approaches can provide the necessary scale level in addressing groups of homeowners instead of individuals, without losing the dire-needed tailor made solutions.

Strategic cooperation with housing corporations

Social housing associations are important actors, being the biggest homeowners. Contracts with housing corporations are used: corporations agree to take responsibility for their building stock, in exchange for benefits in other projects. Moreover, private homeowners can (voluntarily) join renovation programmes of corporations, thereby profiting from scale economy advantages.

Cooperation between government levels

Different actions from governments at different levels confuse the homeowner. A tailor-made process description with clear steps provides clarity to homeowners. All actions need to be aligned to maximize impact. As the value chain is mostly organised on regional level, actions from governments need to be organised on regional level as well.

Key drivers

- Awareness rising by making present energy use and saving possibilities visible.
- Innovative financial arrangements
- Central ‘energy renovation desk’ with proactive approach towards homeowners (CRM-approach) on regional level
- Clear and unambiguous promotion scheme aligned for all governments
- Cooperation with homeowner corporations and area-based approaches to address groups of homeowners

Local Implementation Plan for Assen Energy Efficient Households

SUBJECT

Stimulation of a proactive public governance practice in Assen that promotes cost-effective energy retrofitting, inspires residents and promotes innovation in energy efficient retrofitting in private and social housing in the city. The City of Assen wants to promote more and better energy retrofitting projects in the city and especially in the deprived areas (Areas for Urban Renewal). To do this, several teams within the municipality of Assen need to work closer and more focused. This needs to be done both in policy as in implementation.

GOALS

- Improved citizens’ participation
- Improving the energy label of dwellings to minimum label C
- Pushing forward the innovation in retrofitting towards energy neutral
- Improving the business models for EE
- Better measuring of EE results in urban renewal
- EE partnerships and collaboration with the grid administrator
- Improved horizontal collaboration and citizens’ participation

STRATEGY

Value chain integration

Integrating different actors in the value chain will secure a better proposal to the consumer, bringing costs and benefits together at the same decision point. The association 'SLIM wonen met energie' proves that integration improves the proposal for the consumer and can accelerate EE.

Horizontal cooperation

An area-based approach, combining measures from different task fields in the municipality on one location is very effective in activating private homeowners to invest in renovation measures.

Strategic cooperation with housing corporations

Social housing associations are important actors, being the biggest homeowners. Being a large market, social housing associations can push forward innovation. Contracts with housing corporations are used: corporations agree to take responsibility for their building stock, in exchange for benefits in other projects.

Cooperation between government levels

Different actions from governments at different levels confuse the homeowner. A tailor-made process description with clear steps provides clarity to homeowners. All actions need to be aligned to maximize impact. As the value chain is mostly organised on regional level, actions from governments need to be organised on regional level as well. With the Public Private Partnership on regional level (DEAL: Drents Energy Alliance) we have the opportunity to cooperate. Together with the associations of Dutch building and infrastructure companies, installing companies and technical retailers, environmental organisation and 12 other regional governments we agreed to work together, at least for the next two years.

MAIN ACTIONS

- New city housing policy with incorporated EE policy, based on among others mapping of energy-use and survey among citizens
- Continue the subsidized energy advice (report with suggestions for improvement), but making it more interactive with neighbours.
- Intensify the communication on good practices within the neighbourhood and city. Stimulate citizens' to tell their EE story
- Intensify the Area Based approach and expand to more areas
- Two large scale communication campaigns: 'Zon zoekt Drent' (information and funding of solar panels) and 'Drent zit er warmpjes bij' (information on insulation of the houses)
- Pushing forward retrofitting houses towards energy neutral in cooperation with citizens, construction firms, public funds, etc.

CALENDAR

- Dec 2014: Presentation of Assen Sustainability program to Board of Mayor and Eldermen, inclusive request of budget for four years (approved)
- March 2015: concept new Housing Policy with integrated Energy Efficiency policy
- March 2015: start of campaign Zon zoekt Drent
- March 2015: launch of the new digital platform of DEAL
- April 2015: Elaborated Assen Sustainability Program with assignments to several teams within Assen municipality
- Summer 2015: Opening of new area based approaches in (at least) Assen-Oost
- Autumn 2015: start of campaign Drent zit er warmpjes bij
- 2015: free energy advices for private homeowners
- 2015: Collaboration with the main energy provider

- Autumn 2015: opening of the first Energy Neutral Retrofitted houses in the Lariks in Assen

Benchmarks

Of 30.000 houses in Assen, 8.000 are privately owned and not sufficiently energy efficient at this moment (built before 1995). At this moment, 370 of these 8.000 houses are improved. Projected on the region, we expect that out of the 220.000 households, approximately 59.000 houses will need energy efficiency improvements, where probably around 2.500 houses already have been improved already. To reach our target, another 3.600 (Assen) or 27.000 (region) houses need to be improved.

SWOT

Strengths	Integrated and coordinated approach, combining different actions from all actors, to maximize impact and minimize confusion for the homeowner. Groups of homeowners can be addressed. Financial engineering provides funding for the process.
Weaknesses	Local government is still leading the process, so capacity and process budgets are still needed to keep the process going. Homeowner is not obliged to join the process.
Opportunities	All present and future stimulation actions on all government levels can be easily incorporated into the process. Area-based approach secures alignment with other government goals.
Threats	Strategy is built on voluntary involvement of many actors, so government is not in full control of pace and overall effectiveness.

Issues for dialogue with IMEA partners

Value chain integration

- Experiences with creative financial arrangements (financial engineering)
- Examples of one-stop shopping solutions

Horizontal cooperation

- Experiences with area-based approaches
- How to select the right areas for these approaches
- How to involve private homeowners in this approach

Strategic cooperation with housing corporations

- Contents of a contract with a housing corporation
- Aspects to offer in return for their actions
- How can private homeowners join the corporation renovation programmes

Cooperation between government levels

- Experiences with regional task forces, superseding local governments
- How to align different stimulation actions with different specific demands
- Clear communication with the homeowner (“speaking with one mouth”)

Questions that we currently deal with:

How to scale up our approach, so from the individual homeowner towards groups of homeowners, as to increase the speed of EE-improvements in

Assen?

Area-based approaches: how to combine EE-improvements with other activities from municipality, housing corporations and other actors in the same area?

How can the energy advice (report with energy label and suggestions for improvement) be financed from expected benefits, instead of lump sum up-front payment?

How to promote proactive administration practices combining activities of governments on different levels and private parties?

Experiences with stimulating local entrepreneurs to form consortia offering a one stop shopping solutions for the homeowner (advice, financing, measures and labelling)

Some experience with funding mechanism of sustainability loan
Monitoring using GIS-data, municipal administration and information from other sources combined into one “dashboard” & CRM-system (in development)

Focusing all activities on the ‘customer journey’ □ focusing on actions of the consumer

“Natural moments” that can be used to interest homeowners to invest in EE improvement

Street-based approach where homeowners stimulate each other to invest in EE improvement

Contract-based relationship with housing corporations for EE improvement (typical approach in the Netherlands)

Some first experiences with approaches for homeowners associations (3 pilots)

4. Romanian IMEA Change Case – Zone Istoric

The Romanian Ministry of Regional Development and Tourism, and Oradea Metropolitan Area, February 2013

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Short overview - historical centres

After the '90s, most of the historical centres of the Romanian cities underwent a process of continuous decline, caused by a combination of factors - economic, social, uncertainties regarding the legal framework - which has affected the competitiveness of urban settlements in the context of the fierce competition to attract investment and skilled population. From a physical point of view, the national built and cultural heritage is in a poor condition and the degradation is progressing at a faster rate than the protection or conservation measures, situation that is caused by a series of legislative problems and issues related to other fields: heritage, transport (accessibility), environment, economy (access to services), social protection, retrofitting of buildings, real estate developments.

The lack of a necessary legislative framework useful to intervene on buildings in the historical centre (buildings of historical or architectural value, part of protected areas) has made local public authorities not able to use European funds meant for integrated development in other issues apart from intervening on the public space. Moreover, there are few references to historical centres in the Romanian legislation, the term being assimilated in general to the larger term of protected built area. The cities' historical centre phrase appears in annex no. 3 of Law no.5/ 2000 regarding the approval of the National Spatial Plan – section III – protected areas (I. Values of national cultural heritage – historical monuments of exceptional national value), 1. Monuments and architectural ensembles, letter g – Urban ensembles. Listed here are administrative units with high concentration of built heritage of national cultural value.

The Law no. 350/2001 regarding spatial planning and urbanism completes the definition of protected areas from Law no. 5/2000. Thus, these areas present public interest and are defined as such not just for reaching the specific objectives of conservation for heritage values, but also for their rehabilitation.

Two concepts have to be taken into account in the context of historical centres:

- 1 **Protected built areas** which are stipulated in the National Spatial Plan
- 2 **Monument buildings** which have a dedicated law – Law no. 422/2001 regarding the protection of historical buildings; moreover, there is a List of Historical Monuments.

The lack of a clear definition of elements (intervention arrangements in areas with historical monuments, the demarcation of ensembles and sites, the lack of definition regarding “protected built areas” and “historical centres”) and a number of gaps in correlating the existent legislation with related provisions, such as the correlation of law no.5/2000 with the List of Historical Monuments, led to difficulties in applying the law. All these aspects have serious repercussions on how the state, through institutions, acts to punish illegal interventions in these areas. On the other hand, in the application process for the specific legislation, difficulties were faced in establishing the protected areas, starting from the existing inadequacies in regulations. Thus, the monuments can be divided into typological categories as they are mentioned in the Law no.5/2000, typology that doesn’t follow closely the established categories from Law no. 422/2001 regarding the protection of historical monuments. In fact, protected built areas, defined as “historic city centres”, which also include new constructions, are included in the List of Historical Monuments in the “assembly” or “sites” categories, producing serious disturbances in the building approval process.



View over Bucharest.

Programs for energy efficiency in Romania

In Romania, there is a National Program for Retrofitting, referring mainly to blocks of flats built between 1950 and 1990 (the Communist period). Therefore, the historical centres of cities are left aside. One reason is that technical solutions are more flexible for such buildings comparing to the ones from protected areas or for monument buildings.

However, city centres are formed from households in a percentage higher than 80%, and they are responsible for a significant percentage of the ener-

gy consumption. "The main battle for urban sustainability will be to reach a maximum eco-efficiency in existing urban tissue" says the Toledo Declaration adopted in 2010 by the European ministers of urban development. In order to develop sustainable urban regeneration, key issues such as energy efficiency of existing buildings must be taken into account, depending on the physical condition of the building stock.

New regulations for the retrofitting in Romania

Romania has received the European Commission's approval to finance from European funds the projects for retrofitting of housing blocks. In parallel with the negotiations with the EC, it was necessary to fix the legislation. Thus, the Government approved the new regulations, allowing retrofitting to be made with European financial contribution, supplemented by a share from town halls, as well as a minimum owner's contribution. The new normative act provides for city halls the possibility to take over the financial burden of the owners associations, but with subsequent recovery of amounts within maximum 10 years. The Ordinance also stipulates that blocks to be undergoing retrofitting will be prioritized according to the level of energy performance (starting with the most energy inefficient housing blocks), number of flats (starting with the housing blocks having the highest number of flats) and year of construction (starting with the oldest housing blocks).



Retrofitting – blocks of flats

Key challenge: Historical centres

- After the '90s, most of the historical centres of the Romanian cities underwent a process of continuous decline, caused by a combination of factors - economic, social, uncertainties regarding the legal framework
- The lack of a necessary legislative framework useful to intervene on buildings in the historical centre has made local public authorities not able to use European funds meant for integrated development in other issues apart from intervening on the public space.

- Rehabilitation works for historical monuments and for other buildings situated in historical centers need to assure an increased quality of the execution, without affecting the architecture of the building.

In consequence, the popular technical solution for rehabilitation in Romania - the use of insulation material on the facade is excluded.

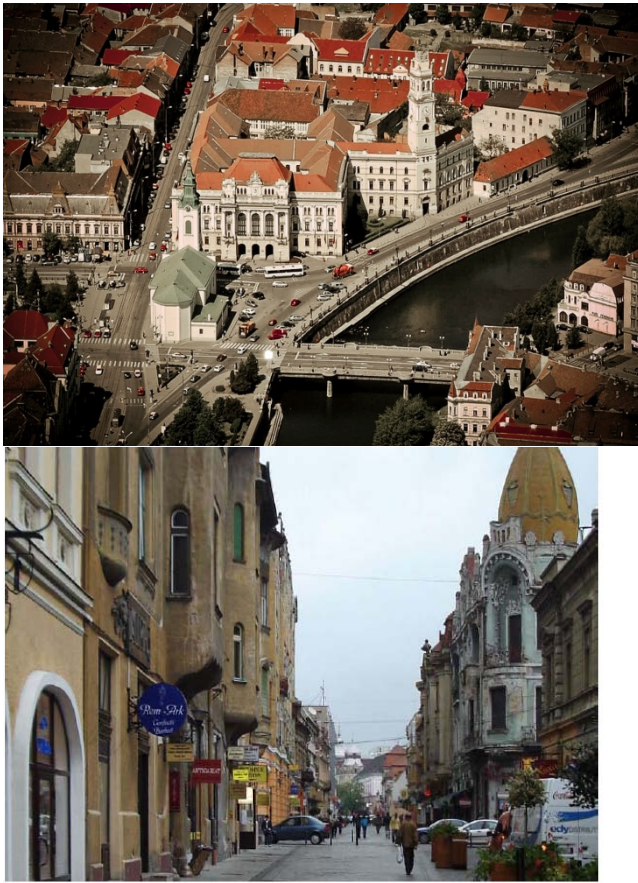


Fig. 3 – Oradea city center

Change strategy, learning agenda and key drivers

- The Ministry of Regional Development and Tourism has under development a public policy proposal regarding the rehabilitation of historical centres.
- Complementary with the need of establishing a legal framework it is mandatory to define and develop through scientific research and knowledge exchange clear operational tools and procedures regarding new technical solutions for the retrofitting of historical buildings.
- These solutions should preserve the architectural identity of the historical sites in order not to alter their value.
- Introducing of energy efficiency measures in the main urban plans, regulations and programs related to the construction/rehabilitation of buildings;
- Promoting of PPP in view of implementing of local energy efficiency financing programs in the existing building stock from the City of Oradea;
- Transfer and Adapting of validated expertise/best practices from other cities (represented by the project partners) in terms of conceiving of targeted policies/measures in this field;

Expected outcomes

- Formulating guiding principles in order to support the EE retrofitting interventions on historical buildings and in historical centers
- Providing technical solutions suitable for retrofitting in historical centers
- Creating the frame for an integrated rehabilitation of historical centers equals with attracting investors, creating jobs, improving the housing stock and the living conditions, supporting urban tourism, all in a context of energy efficiency
- Energy audit of buildings at the level of the Oradea City Center.
- Solution Study for providing the buildings with equipments that use the RES (Renewable Energy Systems).
- PPP models for financing various energy efficiency measures in the current built patrimony at the level of the City of Oradea.(including Cost Benefit Analysis).

Ministry of Regional Development and Public Administration and Oradea Metropolitan Area - needs of expertise

- A review of good practices that could be applied to Romania in order to develop a retrofitting strategy for the historical centers (protected built areas and historical monuments)
- Approaches and instruments for the energetic auditing for the historical centers (protected built areas and historical monuments)
- Administrative mechanisms and financial instruments supporting interventions of retrofitting for the historical centers (protected built areas and historical monuments)

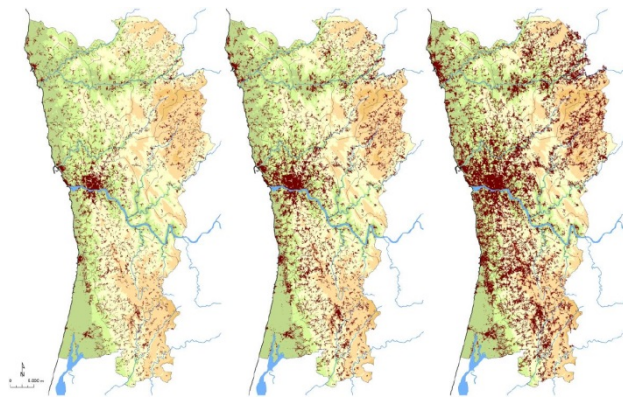
5. The Portuguese CC “ENERGY MATRIX”

The Portuguese Spatial Planning and Urban Development General Directorate (DGOTDU) and The Intermunicipal Association Lezíria do Tejo (CIMLT)

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A baseline analysis: Context and nature of challenge

Problem-definition



Throughout the last 60 years Portugal underwent an intensive territorial transformation. Urban demographic shifts systematically occurred without the corresponding increase in the quality of urban housing, environmental and transport infrastructure. Deregulated growth patterns led to *fragmentation* and spatial and functional *segregation* of city systems, which now face *efficiency and vulnerability* problems, aggravated by the steep increase in private individual *motorized mobility* paradigm. Adding to *suburbanization*, *coastalization* and *metropolitanization* processes are ongoing while Portuguese *non-metropolitan medium sized cities* face multiple growth challenges.

Over the last decade energy efficiency has become a top priority of climate change mitigation related policy worldwide. Since 2007, the European 20-20-20 ‘climate change and energy package’ –that targeted a 20% reduction in primary energy use compared with projected levels– placed an added spotlight on energy consumption and generated an increasing concern about Portuguese energy efficiency shortcomings.



Policy was oriented at national level towards promotion of endogenous renewable electrical energy production during the last decade, which resulted in an average share of nearly half of electrical energy consumption coming from renewable origin. Still, electrical energy only accounts for 20% overall energy used. Portugal still faces a high external dependence on fossil fuels and continuously growing energy intensity.

Current challenges pertain to providing ground for *additional, smart renewable energy vectors* to integrate the supply mix, harnessing the *energy efficiency* improvement opportunities in the *urban buildings, water, waste, transport and industrial sectors* and developing strong *consumer driven demand side management* awareness and communication.



The territory is the basic platform where human activity and interaction occurs. Apart from geo-climatic conditionings and the conflict between the state of the art and path dependency of energy technologies, the territorial management structure and the spatial arrangement of activities and land use affect the energy equation to a great extent, where energy production and consumption patterns are thoroughly linked to the type, space and time of human activity. However, this rational was seldom reflected in the Portuguese territorial development and planning instruments and processes.



The critical path towards the achievement of energy sustainability is dependent on our territory's and cities' ability to respond to their efficiency shortcomings and recognize efficiency opportunities. This requires a territorially integrated response, compelling decision and policy makers from all sectors and government tiers to consider a systematic and harmonized territorial response to energy sustainability, based on local information, knowledge, strategy and action and oriented towards multi-level coordination.

We are, nonetheless, still far from achieving both vertical as well as horizontal policy integration. Top-down renewable energy and energy efficiency policy is yet to consolidate a coherent and enduring conduit into the regional, sub-regional and local governance levels, a fact that can be explained by several interacting factors:

- *Limited information on energy sustainability, especially downscaled and calibrated at the local level;*
- *Incomplete Sub-regional Energy Agencies implementation;*
- *Transport and mobility, Energy and Low carbon policy agencies with separate agendas only at national level and without any underlying territorial criteria;*
- *Dispersion of energy sustainability investments in EU funding framework;*

Institutional context and specific change agenda

DGT's institutional context



DGT is the Portuguese national agency responsible for territorial and urban development. Originally responsible for the spatial planning legal framework and for ensuring strategic coordination and governance between different planning tiers, including the *National Program for Territorial Development Policy*, the *National Sectorial Plans* and the *Regional and Municipal Territorial Development Plans*. DGT also managed national urban policy, known as the POLIS XXI Program, aiming to establish and strengthen the national urban system and directing EU 2007-2013 financing to urban networking, innovation and regeneration. Our link to energy policy came precisely through the urban innovation financing program and the associated thematic of urban energy systems.

Sub-regional collaboration arenas - Inter-Municipal Communities and Metropolitan Areas



The Portuguese 1976 Constitution, based on the principles of decentralization and subsidiarity, established a four tier territorial governance system comprising the national, the regional, the municipal and the parish level (the latter known as *freguesias*). However, the Regional tier was not immediately implemented

In the mid 1980's, spontaneous Associations of Municipalities started appearing and finally in 1998 a "creation of regions" national *referendum* was held but failed, which ultimately means that the constitutional reform lies incomplete. As a response to the multi-level integration void that remained, the Regional Development Agenda, and notably Planning and Funding responsibilities were concentrated in *Regional Coordination and Development Commissions*. In the past 15 years several additional decentralization steps were taken involving the transference of competencies and attributions from the Central to the Local Administration, while the Associations of Municipalities eventually developed into the *Inter-Municipal Communities* (CIM).

There is an ongoing political discussion on the possible balances in the governance architecture between the *Regional Coordination and Development Commissions*, the *Inter-municipal Communities* and *Metropolitan Areas*, the *Municipalities* and the *Freguesias* aiming to "qualify municipal associations, deepen legitimacy and democratic control of *Inter-municipal Communities* and *Metropolitan Areas*" (*Administrative Decentralization Green Book*).



Underlying is also the assumption that efficiency and efficacy gains might be obtained by centring strategic rationality within the CIM and MA. The CIM have already played a significant role in previous decentralization of compe-

tences to Municipalities, especially those linked to environment, territorial development and the water and waste sectors.

Since 1994 the Municipal Associations have negotiated and assumed the management of municipal and inter-municipal EU funded investments worth billions of Euros: in the 2007-2013 programming period the CIM's have been responsible for 25% regionally appointed ERDF funding, while CIMLT has managed 172 million Euros alone since the mid 1990's.



More recently several Energy Agencies were created outside of the Metropolitan Areas, also assuming a sub-regional figurine.

European concerns regarding the next ESF period were focused on integration and territorialisation from the outset, introducing the Multi-funding perspective, an array of specific Thematic Objectives (Low Carbon being one of them) in line with EU Strategies and a specific sub-regionally based territorial integration instrument, the Integrated Territorial Investments (ITI).



In *Portugal 2020*, the Portuguese *Partnership Agreement*, the ITI's will be devised by the Sub-regional CIM's through a *Territorial Development Strategy* that will explain the investments to be negotiated with both National and Regional Operational Programmes, coming from the European Regional Development Fund, the European Social Fund and the Cohesion Fund.

Ultimately, we believe that the ITI instrument poses as a unique opportunity for Energy Sustainability integration, offering the related sectors the possibility of implementing their policies at manageable territorial levels and adjusting them in order to reflect specific characteristics or priority problems, while Municipalities can profit from both the added information and knowledge, strategic resource pooling and cooperation and financial package coming from ITI's.



The Territorial Energy Efficiency Matrix instrument intends to test a diagnostic and strategy process in a sub-regional environment that may serve as the basic input for the *Energy Sustainability Program* to incorporate in the CIM Lezíria do Tejo's ITI. However, it is also important to stress that our change-case will help identify and tackle some of the potential problems that this approach might face:

- *Information and governance gaps;*
- *Capacity and resource differential* between sub-regional bodies,
- *Lack of confidence on Inter-municipal cooperation* from Municipalities.

Change strategy, learning agenda and key drivers

Change strategy and learning agenda

Our *ambition* is essentially to improve overall energy governance, participating in a horizontal energy sustainability agenda at national level, ensuring a line of multi-level articulation between national, regional, sub-regional and local level agencies and promoting Inter-municipal strategic cooperation necessary to obtain and profit from EU financed implementation.

Our *change strategy* was to partner with a CIM which is in the process of developing its territorial strategy for the 2014-2020 ESF period, sharing the deployment and risks of an innovative approach to energy sustainability and providing the technical support of a recognized expert institution. Energy related information is scarce at sub-regional levels, especially in NUTIII such as Lezíria do Tejo which have no Energy Agency setup. An energy information and diagnostic process was the most reasonable first initiative to take on. The process of the *Territorial Energy Efficiency Matrix* will allow us the subject matter to test and eventually demonstrate the Portuguese sub-regional level's potential for institutional, technical and operational agencing of Energy Sustainability. We will focus on setting up a local stakeholder platform to collect and analyse energy potential and performance opportunities and we will try to explore the spatial perspective of energy efficiency.

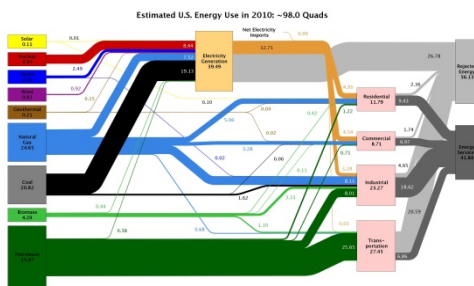
Our *learning agenda* revolves around assessing basic *technical resource input and tools* needed to support the CIM's energy agencing activity on *information building* (gathering, analysing and sharing), *awareness and communication*, *strategy development*, *institutional governance* and *financing* and evaluating the CIM's as *centres for strategic rationality on energy sustainability*, supporting Municipalities and involving sub-regional stakeholders and managing an open cooperation platform around energy related issues:



- 1 Sustainable energy production sub-regional potential;
- 2 Municipal energy efficiency;
- 3 Urban systems energy efficiency;
- 4 Energy consumption from different stakeholders;
- 5 Public space and landscape management;
- 6 Target areas for energy regeneration (deprived, retrofitting, grey fields, industrial, business etc.);
- 7 Transport and mobility;
- 8 Energy education and awareness.

Change Case - Territorial Energy Efficiency Matrix

The TEEM



The *Territorial Energy Efficiency Matrix* (TEEM) is in essence a process of analysis that will typically describe primary, final and useful energy use by form, origin, sector and building type.

The resulting matrixes are then integrated into a schematic energy cycle, which produces the *Sankey diagram*, graphically depicting energy flows and energy waste and thus helping to pinpoint priority energy efficiency areas. A few basic matrixes have already been developed which gather statistical data but have yet to produce strategic and operational effects on energy sustainability. We aimed to go further with our *change case*:

- 1 Develop a set of baseline *energy performance indicators*;
- 2 *Interact with stakeholders directly* both in information as well as strategy phases;
- 3 Integrate available and *relevant spatial information*;
- 4 Explore *renewable supply and matching demand potential*;
- 5 Understand *Energy Sustainability financing*.

Implementation



Change Case implementation initiated during 2012, when the first contacts were established with the CIM Lezíria do Tejo, which had been working with DGT in projects related to urban rehabilitation and spatial information. The CIM was active even then on a street lighting energy efficiency study, so they were already aware and open to cooperation on this matter. For DGT, the CIM Lezíria do Tejo posed as the ideal sub-regional partner also because they had to overcome the absence of an Energy Agency in their territory.

The idea of the *territorial matrix* was linked to the fact that DGT wanted to explore the possibility of crossing statistical energy data with spatial information, institutional arrangements and sub-regional stakeholder input.



As an innovative approach to a known tool, DGT contacted Professor Eduardo Oliveira Fernandes, the coordinator of Oporto Engineering Faculty Research institute IDMEC, in order to have an energy expert input into the development of the *territorial matrix* concept and its application in the CIM Lezíria do Tejo. A set of technical specifications was then produced between IDMEC and DGT that would guide the *change case* implementation.



We re-established contact with the CIM only to find that they had, independently from IMEA, hired an energy expert to develop and implement a Low Carbon Program aimed at Municipal Energy Efficiency. Common interest in the matrix was evident and a stakeholder involvement Seminar was arranged in Santarém jointly with the CIM and IDMEC, where we explained

the TEEM process, inviting the 11 Municipalities and multiple sub-regional stakeholders to participate in the effort.

Turnout was very good and interest and commitment to the project, both from stakeholders as well as the CIM Lezíria do Tejo team was manifest. IDMEC and the CIM have since been cooperating with stakeholders to produce a preliminary report to be presented the 12th of December and closed until the end of the year.

Future Prospects

Although we are very happy with the TEEM developments, we are also aware that it is not an end in itself. In that sense, we intend to use the results of the change case in order to exert a positive change in the energy governance framework:

- a) CIM and Energy Agencies' collection and sharing of energy information and knowledge;
- b) National sectors and operational programs regarding the *territorial approach to energy efficiency*;
- c) Multi-level territorial stakeholders on using the ESF framework to promote *energy sustainability*.

Interaction with national sectors was also pursued during the last year. Our strategy was to involve the agencies directly responsible for the low carbon agenda with the TEEM, first as observers of the process, eventually providing some proprietary information they own, and later as adepts and communication partners of the territorial efficiency approach.

There are two interconnected processes still occurring that will influence the viability of dissemination of the territorial matrix approach: the national and regional ESF Operational Framework and the ITI implementation.



On the latter, we are facing the possibility of actually including the CIM Lezíria do Tejo's *territorial matrix* strategic recommendations in the Territorial Development Strategy that will support the CIM Lezíria do Tejo ITI, and thus close the circle on the implementation perspectives.



Other prospects for the territorial matrix have to do with interaction with the *Sustainable Energy Action Plans* and with the contribution to the Portuguese *Green Growth Commitment*.

What are the key drivers?

CIM ITI's and 20-20-20 european rational

Financial package associated to Low Carbon Policy in the Operational Programs

Energy information and strategy capacity of CIM's or strength of partnership with energy agencies.

Interest of national sectors in using ITI's as a territorialisation instrument

What is the necessary learning process involved?

Learning process will be mainly linked to the TEEM's ability to produce sound strategies and programs for EU financing.

What are the key stakeholders?



National level agencies

Due to its transversal nature, most national level agencies have a part to play in national energy efficiency performance. However, we decided to consider only the ones directly involved the low carbon agenda:

- I. the *Portuguese Environment Agency*, which also manages climate change policy, water and waste,
- II. the *National Energy Agency*, which owns certification,
- III. the *Energy Services Regulator Authority*, which promotes the Electrical Energy Efficiency Plan,
- IV. The *Energy General Directorate*, responsible for National Energy Efficiency and Renewables Action Plans
- V. The Transport and Mobility Institute



Territorial agencies

Relevant territorial development and management agencies include all the sub-national authorities at different levels:

- I. Regional Coordination and Development Commissions;
- II. Inter-municipal Communities and Metropolitan Areas;

- III. Municipalities
- IV. Sub-regional Energy Agencies

Sub-regional stakeholders

Territorial stakeholders were selected according to a shortlist suggested by IDMEC to the CIM, which identified the relevant organizations to involve. They include:

- I. Economic and industrial associations;
- II. Urban waste cycle companies – Inter-municipal and private;
- III. Urban water cycle companies – Inter-municipal and private;
- IV. Local development agencies;
- V. Sub-regional and national farmers association;
- VI. Transport companies.



ESF framework stakeholders

Operational ESF stakeholders were selected according to current Portugal 2020 Management Authorities architecture. They include:

- I. Agency for Cohesion and Development
- II. National Operational Programs and especially the low carbon objective axis;
- III. Regional Operational Programs



Benchmarks and expected outcomes

- I. Number of Matrixes developed in 2020.
- II. % of ITI's including a Sustainable Energy Strategy in 2020
- III. % of ITI's with a full climate-change strategy package implemented in 2020
- IV. Average % of climate-change investment Programs in SUD strategies
- V. Overall GEE emissions reductions from climate-change investment in SUD strategies

Figure 1: IMEA Change Cases

CCs in IMEA	Focus	Problem analysis	Change dimension	Change strategy	Actions	Stakeholders	Benchmarks
CIMLT, DGOTDU (p 10)	Energy matrix Cross-municipal energy strategy, Lezíria do Tejo	Deficient coordination and integration vertically and horizontally Lack of territorial focus of national policies Reduced information available	Relation between energy matrix, SUD strategies, ITI's and CIM-process	Climate-change policy umbrella CIM as energy agency Spatial platform for information and involvement	Energy Matrix Geographical Information System (GIS) Local Energy Partnership	Energy providers Energy industries Energy consultants National Public agencies Renewable producers Sub-regional energy agencies CCDR's CIM's Municipalities R&D sector Energy users	n° of Matrixes, Sustainable Energy Strategy, GEE reduction from related investment programs

Figure 2: Themes in CCs

	EE building renovation	Integrated Sustainable urban regeneration	Innovation of energy system	Stakeholder involvement	Involvement of homeowners associations	Network governance	Area-based approach	EE Funding mechanisms	EE & architecture	GIS	Other?
P 10		X	X	X		X		X		X	

6. The Portuguese CC: “Win-Win in Bensaúde”

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IMEA – INTEGRATED MEASURES FOR AN ENERGY EFFICIENCY APPROACH

GEBALIS, EM
WIN-WIN BENSÁUDE

I - CONTEXT

GEBALIS, EM is a municipal company of public service and private law, of the city of Lisbon (capital city). It was created in 1995 to ensure the management of the social neighborhoods of city, that Lisbon Municipality has entrusted to the enterprise. It aims to ensure an integrated management policy, aimed at the management of municipal houses of social attribution, pursuing social quality of life of local residents and patrimony conservation. Its mission is to effectively manage those neighborhoods with a strong perspective of development and social integration, environmental education, patrimony conservation and professional integration of the population.

The enterprise is responsible for 66 residential neighborhoods, that include ca. 23 000 houses of social attribution and about 1200 local stores of small dimension (ca. 1200 out of which about 800 have been attributed to social/nonprofit organizations - 50/60 square meters each, in general).

Gebalis annual revenue is about €22 million (2012). This revenue comes *only* from social rents, namely social and technical rents of municipal houses of social attribution and local stores.

In terms of rehabilitation, Gebalis is only responsible for conservation and small rehabilitation works. For bigger rehabilitation projects the enterprise signs the necessary “*programme contract*” with the Municipality of Lisbon

that includes: time period of the project/contract, specifications and building rehabilitation agreement and, value of the contract. With this “programme contract” Gebalis pursues the work and contracts other needed services/works, following compulsory Portuguese public procurement rules.

Other revenue sources are national and international co-financed projects (like IMEA) that allow the enterprise to develop, contribute and be involved in larger scales interventions, in favor of Lisbon development strategy and improvement of Lisbon citizens quality of life, with special attention for residents in municipal houses of social attribution.

The estimated population living in the districts under GEBALIS management is estimated to be over 82000 people (number registered for surveyed residents of Census 2011, only), which means that about 1/5 of Lisbon residents (Lisbon residents in total: ca. 500 000 people) are living in social houses which makes the resident population in the districts managed by the enterprise a significant group for the life of the city.

In spite of its medium³ size dimension, as an enterprise devoted to the sector of “Social Housing” alone, it is the larger in its kind in Portugal and in Europe (the ratio: number of houses per staff member at Gebalis is of 106/technical staff, while the European average⁴, is of 36 houses per staff member – general terms).

GEBALIS is an active member and partner of several national and international organizations, with who develops common interest projects, for all stakeholders involved, and collaborates with several research and benchmarking activities. Some of those organizations are: (international) UNGC - United Nations Global Compact; CEEP Serving the Public - European Center of Public and General Services Enterprises); WFO - World Family Organization; (National) CEEP Portugal, RSO.PT – Portuguese Social Responsibility Organizations Network; APEE – Portuguese Association of Enterprise Ethics; APHM – Portuguese Association of Municipal and Social Housing; UNGP Portugal network; Universities; DECO – Portuguese association of the Consumer; among others that have impact in the urban local and municipal life.

All GEBALIS activities follow the local strategies and policies of Lisbon Municipality (especially with relation with social housing, environment and education). Thus, several technical partnerships are developed with organizations like: ADENE – Portuguese Energy Agency; Lisboa E-Nova – Municipal Energy of Energy and Environment; local Schools, professional schools and Universities.

Also as a municipal enterprise GEBALIS is also obliged to the Environmental and Energy strategy of Lisbon Municipality, signed in 2008, that established energy and environmental goals for the city of Lisbon (within the European directives and framework), were expresses to be willing to achieve at an earlier date (2013) the goals that Portugal compromised to achieve by 2015 and by 2020, and that are reflected in the National Action Plan for Energy Efficiency (Plano Nacional de Acção para a Eficiência Energética) as summarized in the following table:

³ (200 workers, December 2012; (EU standards: Number of staff and annual revenue).

⁴ Cabrera Marcet, F, Pozzo, A, Garcia, E., Picorelli, P, Study of the Public Sector and Compilation of Good Practice in urban Renovation, CECODHAS, 2006.

Description/Goal/Year	EU 2020 ⁵ (até 2020)	National ⁶ (até 2015)	Lisboa ⁷ (até 2013)
Reduction of Gas Emissions	20%		
Contribution to Renewal Energy	20%	31%	
Improvement of Energy Efficiency	20%		
Reduction of primary Energy consumption		10%	8.9%
Reduction of Energy Invoicing in Lisboa		1% year	9.4%
Reduction of Energy Consumption in the City			6,4%
Reduction of Water Consumption in the City			7,8%
Improvement of Recycling of Urban Solid waste			29%

Up to date, GEBALIS was the only municipal enterprise that contributed to the Renewal Energy indicator in Lisbon (and in Portugal), investing in the installation of renewal Energy production systems (solar) in municipal buildings of social housing, taking advantage of a government promotion initiative known as “Micro-generation”⁸, (Legal Support: DL 363/07 de 2-11-2007). But we should also obviate that several Municipalities (including Lisbon) invested in renewal energy systems installations in schools and service buildings.

II – GEBALIS PROPOSAL: CHANGE CASE WIN-WIN BENSÁUDE

The strategic environmental and energy goals compromised by Portugal and its capital are ambitious and they imply a significant change of mentality and behavior at all levels, from politicians to the man in the street, from enterprises to consumers, from decision makers to general population. And along with that change the adoption of new practices, daily habits, and significant, active and participated information to/from and for all involved, if we are to achieve successful results.

⁵ EU objectives.

⁶ Council of Ministers Resolution 80/2008 of 20 de May “Plano Nacional de Acção para a Eficiência Energética” –goals for 2015.

⁷ Site of Lisbon Municipality: www.cm-lisboa.pt. COM (2008) 30 in Estratégia Energético Ambiental para Lisboa; Lisboa E-Nova 2009 – goals for 2013.

⁸ In 2008/2009, 23 photovoltaic solar systems were installed for electric Energy production, in 22 social residential buildings and 1 services building – Headquarter of Gebalis. The average estimated production per year , per system installed is of 5110kWh/year, avoiding an annual average of 2 tons of CO₂ emissions, per system and per year. Thus, just with Gebalis investment, it is estimated to avoid the emission of 46 tons per year of CO₂ to the atmosphere, while producing electricity from renewal sources (solar). Gebalis intends also to use the foreseen revenue to feed energy efficiency social and educational projects.

Because, if in one hand energy efficiency (EE) depends on technical solutions and up-dated and sophisticated equipments', on the other hand and maybe more relevant and important, EE depends mostly on people and organizations representations, attitudes and behaviors towards this matter so present in our every days life⁹.

That is why **GEBALIS proposal for working with IMEA and promoting a EE change case is centered on a social educational methodology**, next to the population living in municipal houses of social attribution, having as study case "Bensaúde" district, where Gebalis wishes to develop, evaluate and write recommendations of local implementation plan for future projects with citizens participation and, in this way, give contribution to European awareness and effective EE projects.

GEBALIS application to participate at IMEA (*Integrated Measures for an Energy Efficiency Approach*) Project, under INTERREG IV C Programmed, was developed having in consideration:

The need and responsibility, as a municipal enterprise, to contribute to "Lisbon Energetic and Environmental Strategy" (Estratégia Energético-Ambiental para Lisboa) as well as to the National Action Plan for Energy Efficiency (Plano Nacional de Acção para a Eficiência Energética);

The need to involve, educate, inform and develop citizenship awareness among social houses residents and to work towards behavior changes, in general, and on EE in particular, that benefit all persons involved but also the local organizations and Lisbon city. This also applies to adequate use of common spaces in the residential buildings and green public spaces as well as safe, effective and economic water and gas consumption;

The existing resources at GEBALIS (Human Resources as well as Technical and Financial own resources) as well as the experience and studies developed throughout the years (since 1995), next to population with different and diverse fragilities;

The possibility of exchanging experiences, and learning with others Partners involved with IMEA;

The chance to invest some of the revenue achieved with Energy Selling (with the photovoltaic solar panels installed), in small dimension rehabilitation works in the residential buildings as well as in social awareness projects;

The possibility to establish partnership and/or contract Energy Experts and Social Awareness Experts and Experienced Staff – as service providers and for the period of the project, for counseling and external evaluation – in order to overcome the lack of Human Resources to develop a local investigation-action EE project.

Last, but not least, the opportunity to re-direction and include EE recommendations in rehabilitation works to be developed by GEBALIS, or at the enterprise responsibility.

⁹ A study publicized in US media stated that, at best chances, a each Family head-man thinks about energy about 6mn a year in total and 90% of the time in terms of "How much does it costs?".

Thus, GEBALIS aims to rehearse a different methodology with participatory dynamics, involving several local Partners (social, educational, commercial, and professional), the residents themselves and other organizations living or working in the social neighborhood where the project takes place, as well as other entities public and private, not only to develop EE awareness but also to value residents' capacity to be part of the solution of their housing problems and recognize their influence (as final consumers) on EE policy changing.

Having these premises in mind, GEBALIS establishes the objectives for Win-Win Bensaúde:

- Mobilize residents and local organizations for voluntary benefit of the district/neighborhood;
- Promote civil and environmental education and motivate adequate behavior change in all daily life aspects and areas of individuals and organizations with particular emphasis on Energy and Energy Efficiency issues;
- Intervene with adequate technical solutions (resulting from negotiation with residents);
- Evaluate interventions and return results and recommendations for improvement, next to main actors of the process (specially for the residents);
- Evaluate and share results of interventions with Partners entities and NGO local organizations and discussion of other/alternative solutions (when needed), including IMEA Partners;
- To influence – by regular reporting to the municipal social councilor – the local political policies of Lisbon, that embed national law and regulations and European directives on Energy Efficiency as well as water consumption.

The philosophy behind all actions is based on an triad information/dissemination – intervention/negotiation – counseling/evaluation, with an ongoing presence in the territory by Gebalis professional and contracted experts and qualified staff, as well as strong investment on communication and feed-back information (to the residents) every time actions take place in Bensaúde district.

Thus, regular and on-time information and communication (both person-to-person and general) play a very important role in this project as it is very important to motivate the target population for the themes we want to address (Energy Efficiency, Environmental adequate behavior and community participation), as well as to promote consequent actions resulting from negotiations with all involved. It is also important to assist with a participated diagnosis and to value the role and participation of local actors, namely the social residents.

Dissemination actions also play an important role attracting public, organizations and decision maker's attention to the Project "Win-Win Bensaúde" and, by doing so, giving evidence to the population participation and impact on the project development.

IMEA Project provides the opportunity (2013/2014), to rehearse a new EE awareness and citizen's participation involvement methodology and, if succeeded, the enterprise compromises to invest a percentage of the Electricity selling through the Project of Micro-generation, to support social Projects and/or new local business/employment opportunities, evolved from this methodology. Further development of the methodology in other social dis-

districts of Lisbon Municipality will depend on the results and outcome of previous action-investigation-participation experience.

Initially the option was to select 2 (Bensaúde and Telheiras) out of the 5 neighborhoods with photovoltaic systems installed, with similar characteristics (both in terms of population and in terms of buildings time of construction, actual state of art of conservation, same type of renewal energy installations, same or close reallocated period). As it was not possible to achieve this first step successfully because GEBALIS does not have 2 similar residential social housing districts, the option was to invest in one district alone (1st stage), if successful, apply same methodology in second district (also with solar panels installed) and if methodology success is confirmed then develop methodology at larger scale in the Lisbon Municipality area.

The main characteristics of the residential housing district that was selected are:

	Bairro Alfredo Bensaúde (Projecto WIN-WIN)
Location	Olivais - Lisboa
Date of Construction	2001
Date of "replacement/re-housing" processes	2001-2001
Number of buildings	35 residential buildings (3 bands of connected buildings: A,B and C)
Number of Houses	357
Estimated living population	1214*
Number of social organizations	4
Number of installed micro-generation systems	3
Difference {Buy – Sell} cost of Energy (Microgeneration renewal energy production - 2012)	-20.218,61€ (1 building is only services: GEBALIS headquarters, (-) 25.237.72€ with energy cost)
Difference {Buy – Sell} cost of Energy (Estimated average per building/per year)	(+) 2.509,55€

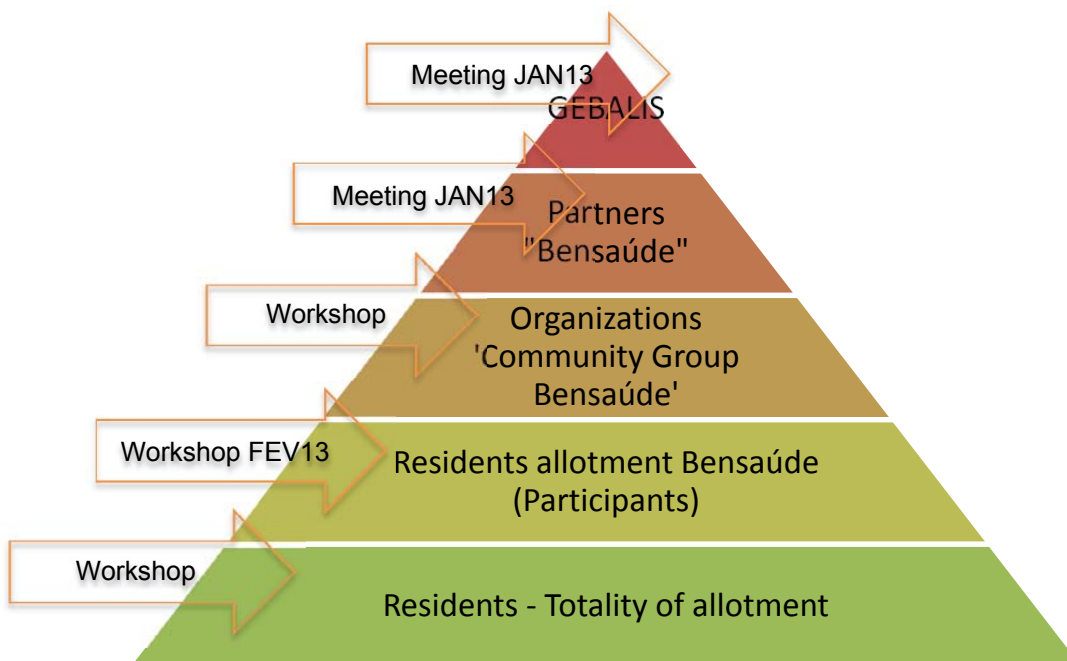
*Estimated 3,5 people per house; data of 01/03/2011)

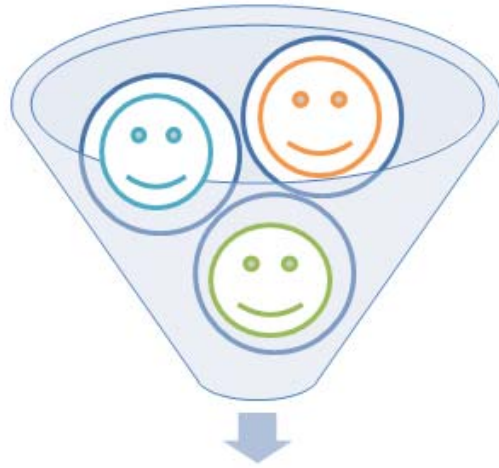
The operational action plan for all interventions involving residents, building-by-building (35 in total) will try to respect the following pattern:

- Residents invitation for open meeting to find solutions for problems in the district;
- Identification, together with the residents about concrete problems need to be solved (what/where/how/by whom), in general, and about Energy in particular;
- Presentation (Gebalis and Partners) possible adequate solutions to residents and 1st workshop on Energy (what it is/where does it come from/how much it costs and why);
- First negotiation with residents (what do the residents do and what does Gebalis and Partners do);
- Second workshops with residents (Energy Invoicing);

- First agreed interventions (By both parties involved, at negotiated and agreed dates/period);
- New negotiation process – next problem to tackle;
- Third workshop (Energy Efficiency and adequate energy and water consumption);
- New interventions... and the cycle repeats for a maximum of 7 different types of problems solved with the participation of the residents, out of which 4 have to be Energy related;
- After every intervention, dissemination of information of what was achieved (including information about participants, results and costs);
- All workshop should be maximum 1 hour length and consider alternative dynamics for children;
- Starting after 2nd intervention with solid results direct information and formal invitation to local leaders and organization to be part of the project;
- Agree and negotiate evaluation time with residents, project staff and Partners organizations;
- Aside achieved results, evaluate appropriation level next to Partners organizations.

WORK ALREADY IN PLACE





FOLLOW-UP ACTIONS:

Local Action Group – Empowerment and Capacity –SET13 – JAN14
 Local Action Group - Community Action JAN14-JUN14
 (Implementation, team building, coaching)

V –BEYOND IMEA

If success comes with the involvement, participation, appropriation and empowerment of the residents in social houses, and of their importance and needed active role in solving problems that affected directly their life or the life of the districts where they live, GEBALIS will be able to continue to support other actions and/or projects that come to be developed in place, not only with dissemination actions but also providing technical and financial support, coming from renewal energy production as well as it will be possible for the enterprise to rehabilitate residential social buildings with the support of “living in” experts that are, at the end, the ones more interested in reducing the energy invoicing and increasing living comfort at their homes.

On the other hand, as GEBALIS revenues only comes from social rents, and that is very limited for the scope of actions that the enterprise is committed to, it would open a new window of possible financial scheme for launching and/or helping social projects that groups of residents and organizations would like to develop in the territory, thus promoting more job opportunities and (expected) better answers to the needs of residents and NGO that live and work in house built by the Municipality of Lisbon for social attribution. GEBALIS would have also a very significant reduction of expenses with interventions that are caused by inappropriate use of the buildings and equipments, as well as for reducing the energy invoicing of the buildings themselves (that are at Gebalis responsibility). The dissemination of good practices and a win-win methodology, beyond Bensaúde and also beyond Lisbon Municipality, can became a source of inspiration for possible solutions concerning EE awareness but not only, since the methodology presents itself of possible to be used for other concepts, as well.

Literature

Commission of the European Communities (COM) (2005) *Green Paper on Energy Efficiency or Doing More With Less*. COM(2005) 265 final.

Ea Energy analyses (2012) Overview of European Union climate and energy policies, Prepared for Climate Strategies by Ea Energy Analyses: Copenhagen. [Online] Available at: http://www.ea-energiana-lyse.dk/reports/1168_overview_of_eu_climate_and_energy_policies.pdf

Engberg (2014) Negotiating Green Retrofitting Standards in Danish Urban Renewal. *Open House International* Vol 39, No 2.

European Commission (2015) The 2020 climate and energy package, Climate Action, EU Action. [Online] available at: http://ec.europa.eu/clima/policies/package/faq_en.htm

Gupta, J., Ivanova, A. (2009) Global energy efficiency governance in the context of climate politics, *Energy Efficiency*, Volume (2), 339-352.

Healey, P. (2007) *Urban Complexity and Spatial Strategies: Towards a Relational Planning for our Times* (London, Routledge).

Kiss, B., McCormick, K. & Neij, L./Mundaca, L. (2010) *Policy Instruments for Energy Efficiency in Buildings: Experiences and Lessons from the Nordic Countries*, International Institute for Industrial Environmental Economics, Lund University, Sweden.

Lombardi, P. and Trossero, E. (2013) Beyond Energy efficiency in evaluating sustainable development in planning and the built environment, *International Journal of Sustainable Building Technology and Urban Development*, 4:4, pp. 274-282.

Nevens, F., N. Frantzeskaki, L. Gorissen, D. Loorbach (2013) Urban Transition Labs: co-creating transformative action for sustainable cities, *Journal of Cleaner Production*, Volume 50, 1 July 2013, pp. 111-122.

Pocas, A.; Tavares, J.; Pekelsma, S. (2013) *Energy Efficient Cities: Joint Action for the Built Environment*, European Urban Knowledge Network: The Hague.

Universitat Politècnica de Catalunya (UPC) (2013) Global Case Study Report: Legal framework, EU The 20-20-20 targets of the European Union focused on the energy efficiency objectives and the supporting idea of Sustainable Energy Communities, 6th UPC International Seminar on Sustainable Technology Development Group 6. [Online] Available at: <https://is.upc.edu/seminaris-i-jornades/seminaris/std-2013/documents/case-studies/reports/group-6>

Wilkinson, P., K.R. Smith, S. Beevers, C. Tonne, & T.Oreszczyn (2007) Energy, energy efficiency, and the built environment, *The Lancet*, Volume 370, Issue 9593, 29 September–5 October 2007, p. 1175-1187.

The 'Integrated Measures for an Energy Efficiency Approach' (IMEA) programme supported local and regional authorities in taking a pro-active role in improving the energy efficiency of the built environment. The programme ended 2014 and was funded by Interreg IV C under the European Regional Development Fund. In this report senior researcher Lars A. Engberg and research assistant Camilla Warmedinger present and analyse the results of the IMEA programme.

Their conclusion is that the effort has been successful: The IMEA partners developed and shared innovative knowledge on integrated energy efficiency measures, strategically organised more effective implementation processes, and, with various degrees of success, improved the energy efficiency of the built environment in their cities.

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