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LOCAL INNOVATION SYSTEM IN NORTHERN FINLAND J CASE RENEWABLE ENERGY SOLUTIONS PILOTS IN OULU

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ABSTRACT

To respond to the dynamics of urban surroundings, enhancing innovativeness in the urban environment has become increasingly important. The major challenge with innovations in urban environment is that many of them do not diffuse easily. The paper identifies the challenges related to urban innovation processes and their scaling-up, using the renewable energy solution pilot project as an example case. This is done by discussing the position and maturity of Renewable Energy Solutions in City Areas (RESCA) in an innovation typology context, and by assessing performed actions aimed at boosting the innovativeness in the case project. Results emphasized the essential role of the local building administration as a proactive stakeholder who started open-mindedly to address old-fashioned, inefficient and dominant practices of the construction industry. Another innovation hot-spot was that market actors needed to collaborate, take steps and present their ideas in order to find, implement and pilot the emerging solutions and innovations.

Keywords: Innovation; Renewable energy; RESCA; Scalability; Urban innovation

1. INTRODUCTION

Innovation is on the agenda of national and local governments, large and small companies, a vast number of institutes covering different sectors of research as well as universities. The reason for this is quite a simple one: innovation is needed to survive competition, be it of whatever nature. Business, commerce, research, public services, competitive advantage of nations, etc. are all dependent on how well they manage their resources and create added value in an ever competitive world.

The added value can mean different things to different stakeholders and it is typical that innovation seeks a step forward for the stakeholders in question. Companies in consumer markets are finding ways to determine how to create products and services that are better selling than those of their competitors. Public sector agencies are considering how they would be able to serve their citizens better in the context of shrinking or static budgets. Research communities need to generate new understanding, technologies and knowledge to serve mankind – or as in many occasions, to satisfy their financiers, both public and private.The pace of innovation cycles is speeding up. New concepts and ideas include marketable orusable products and services.These are expected to be refined in a relatively short time.This has brought forth the need to manage innovation, rather than just fostering it.It can be debated with justification that

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the combination of the words ‘innovation’ and ‘management’is somewhat questionable. It is often claimed that innovations cannot be managed. Perhaps so; however, it is equally fair to postulate that some environments, management models, and work processes are more likely to generate innovations than others. Although innovations may occur in garages, they are more likely to take place in cities with research institutes and universities, than in cities without such premises.

Urban innovation includes innovations in urban environments and urban social contexts, which take place – or are applied in – cities and urban communities. Urban innovation is perhaps a particularly interesting concept as we face many grand challenges that relate to urban areas: social equity, transport problems, public service quality, and environmental damage. These are, of course, the result of urbanization and increasing population densities to the extent that outdated urban structures and organization models do not work effectively any more.

This paper presents an analysis of one effort to tackle one particular urban challenge: energy efficiency and climate change. The context is Renewable Energy Solutions in City Areas (RESCA), particularly in northern Finland, the City of Oulu. The RESCA project is aimed at paving the way for more sustainable energy solutions in a new urban development area. We studied the challenges related to urban innovation processes and their scaling-up, using the RESCA project as an empirical case. This is done by discussing the position and maturity of RESCA in an innovation typology context, and by assessing the performed actions aimed at boosting the innovativeness in the case project.

This case study focuses on one particular sub-project of RESCA in the city of Oulu. In fact, the scope is also limited to one housing area, Hiukkavaara. However, since the largest cities in Finland share common features in terms of size, demography, infrastructure and social structures, the generalization of results and conclusions is most likely feasible throughout the country. The research process was divided into the following sections:

- review of the existing literature and empirical material (literature, RESCA-case materials, etc.)
- description of innovation and planning processes side-by-side
- validation meetings with city officials and other actors
- results, discussion and practical implications

The innovation processes used in literature were applied so that the processes and approaches were adopted in the RESCA case. Some more generic innovation models and frameworks were used to map or position RESCA, as a structured innovation effort. The goal was to identify where in particular RESCA proved to be successful (and where perhaps less so) and how these observations feedback into innovation funding and innovation management.

All along the analysis process, frequent meetings and correspondence with city officials responsible for RESCA were held. This way, the researchers attempted to validate their observations and conclusions.

2. THE INNOVATION PROCESS AND CONCEPTS

Innovation is something ‘new’ that can emerge because of an individual flash of wit, because of an identified urge or need or very slowly progressing towards the solution to a problem. Innovations can take multiple different forms and hence there is no generally accepted definition for innovation. However, many sources have tried to define it, for example, Business Dictionary (2015) defines innovation as a “process of translating an idea or invention into a

good or service that creates value or for which customers will pay. To be called an innovation, an idea must be replicable at an economical cost and must satisfy a specific need."

Likewise, with the concept of 'innovation', there is no single 'innovation process' definition or model either. The innovation process, i.e. the flow of actions or measures towards final innovation can be associated with a single product, a particular process (manufacturing, service, etc.) or it can be understood as the interaction within a multi-stakeholder network that generates new ideas.

Inter-firm collaboration has always been natural part of the evolution and diffusion of innovations. Companies collaborate in various ways which have an impact on the type of innovation; usually the simplest forms of collaborations focus more or less on incremental innovations and development activities, while the most complex collaboration models strive to produce radical solutions and spearhead innovations. Simultaneously, when the collaboration gets deeper, then the complexity of the collaboration network increases as well. Hence, it is typical that the radical innovations are mostly invented in very heterogeneous networks. Typical stakeholders that collaboration may include are customers, suppliers and other partners, competitors, and different institutions, including universities (Belderbos et al., 2004; Un et al., 2010).

In their research, Majava et al. (2013) listed six different collaboration concepts where new innovations may arise. The listed concepts are: *innovation hub, business cluster, business network, business ecosystem, triple helix and keiretsu*. In this research, *Keiretsu* is excluded because it occurs almost exclusively in Japan.

Innovation hub thinking is based on the recent changes and trends in business environments where companies operate. Instead of dominance by a single company, systems consisting of a nodal network (regional) of firms, individual consumers, and consumer communities work together to create value (Prahaladand&Ramaswamy, 2004). Knowledge is distributed among many players, and companies are encouraged to take advantage of the available information, use others' ideas, and even allow others to use theirs (Chesbrough, 2004). Local uncoordinated innovation activities, regional programs, and technology parks have claimed to be evolving towards global innovation hubs (Launonen&Viitanen, 2011). The creation of an innovation hub can be accelerated by different types of programs, organizational forms, and boundary-spanning roles among educational, private, and public domains.

Clusters can be viewed as geographical concentrations of interconnected firms and institutions in a certain field, and the idea of clusters suggests that regions should identify and develop their existing regional competitive advantage (Porter, 1998; Porter, 2000). A business cluster, also known as an industry or competitive cluster, can enhance regional economic growth and income, increase company productivity, drive innovation, and stimulate new businesses (Barkley & Henry, 1997). Clusters may extend downstream to customers and channels, and laterally to producers of complementarities. Linkages and complementarities across industries and institutions most relevant to the competition define cluster boundaries; geographical location is still important, but its value is decreasing (Porter, 1998).

The logic in *ecosystem* thinking is that companies must proactively develop mutually beneficial relationships with customers, suppliers, and competitors (Iansiti&Levien, 2004). A business ecosystem is "an economic community supported by a foundation of interacting organizations and individuals—the organisms of the business world" (Moore, 1996). The economic community produces goods and services for the ecosystem members (customers). Other organisms include the suppliers, lead producers, competitors, and stakeholders. The companies coevolve capabilities around a new innovation: they cooperate and compete to support new products, satisfy customer needs, and finally build successive innovations. Other players adjust

to the rules set by the lead players. The leaders can change, but the community values the role of the leader, which enables the members to move toward a shared future and benefits (Moore, 1996). A business ecosystem should be self-sustaining and be developed through self-organization, emergence and co-evolution, which results in adaptability (Iansiti&Levien, 2004; Peltoniemi&Vuori, 2004).

Business networks can also be considered as consisting of actors that control resources and perform activities: a company is dependent on resources controlled by others, and access to resources is achieved by forming relationships with other actors, creating interdependency between the actors and their relationships in the network (Håkansson&Snehota, 1995). Business networks are "structures of inter-firm relationships that emerge and evolve through continuous interactive processes" (Halinen&Törnroos, 1998). In recent years, business networks have expanded due to industrial restructurings, vertical disaggregation, outsourcing, and a strategic drive to focus on core competencies (Batt & Purchase, 2004).

Triple Helix is much like a business network, but in triple helix the collaboration is driven and steered by the government and the network always includes, in addition to government, participants, those from educational institutes and industrial sectors. Resulting from the governmental steering and education-industry collaboration, triple helixes are strongly connected to and influenced by the national innovation systems. Most countries and regions are striving to boost innovations through university spin-offs, initiatives for knowledge-based economic development and long-term collaboration between companies, government laboratories, and academic research groups. Generally, the only difference between a business network and triple helix is the involvement of government and educational institutes in the triple helix. Therefore, triple helix and business networks are treated as being synonymous in this research.

3. RENEWABLE ENERGY AND SUSTAINABILITY IN NORTHERN FINLAND

The objective of the Finnish government is to raise the share of the renewable energy to thirty-eight percent by the year 2020. This objective also has an impact on the climate strategies of municipalities/cities by setting targets for them. The cities and urban areas differ from each other, but many connecting factors have also been found. These connecting factors are tried and exploited in order to answer climate challenges.

Renewable Energy Solutions in City Areas (RESCA) is a joint-program of the largest towns in Finland, coordinated by Hermia Group. Originally, RESCA started based on the initiative of the City of Tampere and its background lay in the TreSolar solar energy study made by the ECO_2– project (City of Tampere, 2013). Afterwards, the Finnish cities of Tampere, Turku, Oulu, Vantaa and Helsinki and the Environmental Services Authority (HSY) also joined in the program. Within the program, the partners collaborate in increasing the utilization and exploitation of renewable energy and its solutions. The objective of the program is to create a common operating model and to exchange the best practices of the pilot projects with other cities.

RESCA cooperates with the Finnish energy and construction companies as well as public companies. In some cases, Finnish companies can utilize the pilot projects as their own export references. RESCA increases the production of renewable energy and develops models of operation by passing on information and best practices between cities. The pilots are related to several technologies and solutions (Hermia Group, 2014): Hybrid and carbon-neutral solutions of renewable energy; bioenergy; identification of impacts on the environment in town planning and land use; aqua thermal solutions; solar technologies; wind power; and biogas as a vehicle fuel.

The program also serves the promotion of exports indirectly, by giving opportunities for firms to develop and test new products and innovations. In the best case scenario, the companies will be able to utilize the targets as their own references in exporting. RESCA will promote both the attainment of the cities' climate objectives and the development and business operations of the business world from a company perspective (Hermia Group, 2014; City of Oulu, 2014).

3.1. RESCA in Oulu

Oulu is the sixth largest city in Finland, the largest city in northern Finland and the largest and the fastest growing urban center in northern Scandinavia with over 200,000 inhabitants. The visions and strategies of the City of Oulu have mostly focused on the themes of winter and sustainability. In particular, the supervision of building has emphasized the importance of sustainability and new innovations. Hence, these factors strongly support the usage of new and sustainable solutions in construction. Therefore, a few years ago the City of Oulu started a new development initiative that aims at developing more effective methods and processes that enable new and sustainable solutions to be take into account construction and supervision factors.

In Oulu, RESCA aims to create concepts for choosing different kinds of renewable forms of energy for single-family homes and concepts to optimize the combinations of different forms of energies (hybrids). Also the energy efficient solutions of building to enable the use of renewable energies are being developed. The goal is to use the developed concepts to guide new single-family home builders in choosing and using more renewable energies. The final goal is to create well proven and workable solutions for hybrids.

To reach the objectives of RESCA in Oulu, the Oulu Building Supervision Office has started and is supporting the building of circa 45 single-family homes in Hiukkavaara, where 18 companies are participating in RESCA and they are building energy efficient homes with different kinds of combinations of renewable energies to the area. The goals of RESCA in Oulu are the following:

- To produce well-reasoned and safe concepts to guide and help builders and planners in choosing and combining renewable energies for single-family homes.
- Concepts must be simple to use, effective and they need to be applicable to be used in building quality guidance procedures of the supervision office.
- Concepts need to be applicable in other cities and they need to further fulfill the Finland's international obligations for renewable energies.
- Experiences and lessons learned in and gained from living labs can be used and exploited afterwards in the development and planning of other areas in Oulu.

3.2. RESCA vs. Standard Housing Areas

Oulu's burning desire to be a pioneer and their commitment to the ERA17–action (Energy-Smart Built Environment 2017) plan has a clear impact on their all activities and hence on the RESCA–project as well. The ERA17 action plan refers to an energy-efficient, low-emission, high quality built environment that employs all necessary means to mitigate climate change. There are many factors that contribute to energy-smartness: land use, construction, etc.

In line with the ERA17–plan, Oulu has set some constraints and terms for the buildings in the RESCA–area. These constraints and terms are in line with Oulu's objectives but are relatively unusual in the rest of the Finland. In addition, the set constraints separate processes of standard new housing areas and RESCA–areas from each other. The constraints and terms for the houses in RESCA area are, for instance, as follows:

- The plots are only for (development-oriented) firms or educational institutes.
- Energy consumption must be equal or lower than 70% of the set level in the law.

- Houses must utilize “hybrid” energy solutions (i.e., combinations of solar, bio, wind, geothermal, heat pump, wood energy systems)
- Buildings meet nearly zero-energy level.
- Buildings must be sustainable in terms of ecology, economy and society.
- Innovative solutions are prioritized.
- The City of Oulu supports the scaling up of workable and reliable solutions.
- The City of Oulu demands measurements, analysis and monitoring of the pilot houses (temperature, pressure, moisture, heat loss, etc.)
- If solar energy is used or there is a readiness to use it later, the positioning of the house must be taken into account in order to optimize the efficiency of the solar system.
- The gained experiences and results can be, and will be, exploited afterwards.

The aforementioned terms point out clearly that the City of Oulu has contented itself with the minimum level of quality which is set in the National Building Code of Finland. Instead of that, Oulu wants to improve the quality of living of habitants by offering both guidance and possibilities to be a forerunner in the field of renewable energies.

3.3. RESCA’s Outcomes

Oulu’s RESCA–project can be considered successful. The latest news from the field indicates Oulu’s RESCA–project will be awarded later in this year for its success. Once again, it is a clear sign of pioneering and systematic action that has been done in Oulu by the Oulu Building Supervision Office.

When it comes to the concrete results of RESCA, 80% of the RESCA area is under construction by October 2014 and the first houses are already completed. Presumably, most of the buildings can be completed by the end of 2014. The buildings constructed by Oulu Vocational College and Oulu University of Applied Sciences will be ready a bit later, because certain buildings are used also for the training and education of students. Such approach supports the development of local competence, but also the long-term plan of the City of Oulu and Building Supervision Office.

There are plenty of other concrete results that are connected to the RESCA–project. Probably the most noteworthy investment is the 400 MWH Combined Heat and Power (CHP) plant, which will be completed in Summer 2015. The produced heat will be used completely in a terraced house (32 apartments). The power plant will also produce some excess electricity (40 MWh) that will be sold to the local energy company.

The measurements and assessments clearly point out that the completed houses and buildings are very energy efficient and they utilize renewable energy in very innovative manners. For example, the E-number of one completed house ($157m^2$) is as small as 35 (kWh/m^3) while in the ‘traditional version’ of that same house, the E-number can be as high as 173. To get a low E-number, the pilot house utilizes the geothermal, heat pumps and solar energy, and the energy consumption of the house can be monitored in real-time as well. In addition, there are some very innovative and new methods that are going to be used, such as exploiting heat from waste water and the fully automatic control systems.

3.4. Inter-firm Collaboration as a Keystone

Study results emphasize the fact that the inter-firm collaboration can be considered a vital - even the most important - part of the urban innovation and development process. If inter-firm collaboration (see the chapter *innovation process and concepts*) in the RESCA–program is looked at more closely, it can be seen that it contains features from the innovation hub and business network as well as the triple helix (Figure 1).

The reasons are as follows:

- Radical innovations are not expected, but the purpose is to create useful and easily spread solutions.
- The RESCA program is put in practice by companies, but steered by the public authorities (heterogeneous). In addition, research organizations are vital part of the program.
- RESCA participants have mutual objectives, (in general).
- RESCA has integrated coordination, but the rules are set by the public authorities.
- Innovations are mainly company-specific.
- Relationships are formed to achieve objectives and create value, but the primary purpose is not to create global competitiveness.
- RESCA has public funding.
- RESCA is more or less focused on local and regional development activities.

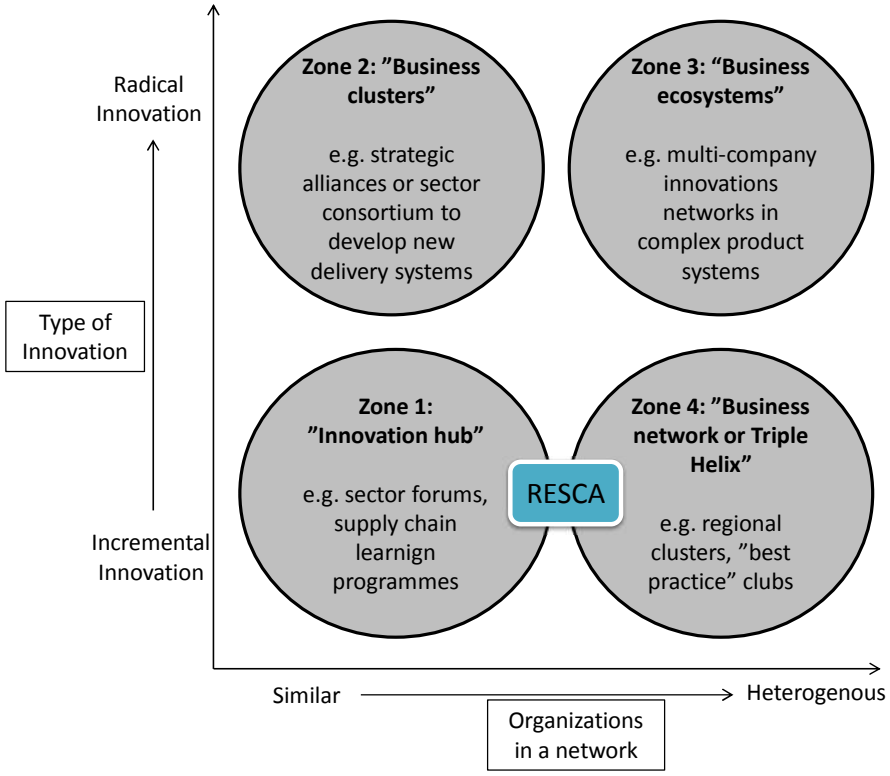

Figure 1 Inter-firm collaboration in RESCA (Aapaoja et al., 2014)

3.5. Innovation hot-spots in RESCA

By innovation hot-spots we mean those phases and milestones in the processes of either RESCA or urban planning, where we judged that innovations actually took or could have taken place. The real hot-spots, as far as we as researchers could identify, was the initiation of RESCA when it was simultaneously acknowledged that the usual building code standard was not going to give results that were both aspired by the local building administration and already available in the market as ready-to-use applications or technologies. In this sense, the role of the administration and the humble confession that they need to set new standards even if the national standards were the only ones really required, even if their action could be viewed as somewhat rebellious – at least in the eyes of some others.

The other hot-spot was that after the aforementioned acknowledgement had been made, the administration quite genuinely allowed market actors (suppliers) to take steps and present their ideas, and furthermore, to actually realize these ideas without any risk that administrational or regulatory standards could be made to work against these ideas. In plain words, some risk-taking was allowed and even encouraged.

The rest of the story of RESCA's innovations remains to be tested in practice and judged by the market. This will inevitably take time and require efforts from the supplier side to convince their potential customers that new solutions and applications work. On the demand side, the experiences of as well as the example set by Oulu building administration are vital and similar type of convincing is needed to persuade other city administrations to take the same steps. The core substance can be anything, not just energy efficiency, and may be associated with a number of urgent urban development issues, for instance, elderly housing, physically activating dwellings and their surroundings, concepts bringing more than one generation together, social cohesion, civil society strengthening models, etc. These are plenty, but to achieve not only one of the targets, but also several at the same time require more than just incremental steps and piloting projects. An integrated approach is truly calling for a systemic change, whereby processes of planning, decision making and market functioning will all need to be renewed.

4. DISCUSSION AND IMPLICATIONS

The ultimate motivation of any city is the concern over citizens' well-being. Citizens require services, such as health care, schools and urban infrastructures, and for these services there need to be a sufficient commercial and industrial base, i.e. firms offering jobs to citizens. The local economy is first and foremost dependent on employment, thus facilitating adequate public services. The cities have realized that their success is almost entirely dependent on the success of the firms operating within the city limits or at least within the vicinity, and on other institutions creating a sense of gravitas that provides income to citizens and furthermore as an incentive for the city to provide services.

Hence, cities have been forced to concentrate on activities that in turn call for innovations to take place. Cities have become innovation hubs and it is a recognizable trend how cities' strategies and planning have changed from 'authorative, centralized planning' into 'innovation and knowledge facilitation'.

4.1. Innovation Scalability

The scale-up scope of RESCA at this stage has primarily been domestic. Many of the companies that have worked with RESCA solutions rely mainly on domestic markets. However, this is not to say that some particular technologies would not have potential to become products or solutions for export. But these efforts must first and foremost be done by the companies themselves. A great deal of after-pilot support is available, though, from the public side in the form of appearances in international fora, hosting delegations from abroad, and so on. Research is also a useful tool, if utilized wisely. Researchers appear in international conferences, events, projects and publish globally. The value of such efforts could be indispensable and serve as a stepping stone for prospective and willing companies to access new markets.

Having said this, the scaling-up of merely energy efficient solutions seems perhaps not at all challenging but in Finland the root problems appear to lie in the planning standards, regulations and decision making systems' rigidity (see also Aapaoja, 2014). This not the case in Oulu; long-term investments in the development building supervision have paid off, for instance having a building permission takes an average of two weeks in Oulu, while in Helsinki and metropolitan area, it takes three to six months.

To go back to what was said about the scaling-up of energy solutions themselves, their scalability should not be a problem, hence the general "rules" still holds. Applying renewable and sustainable energy solutions, for example, to a tropical country (e.g., Indonesia) requires the same holistic approach as in Finland. To exploit renewable energy solutions effectively as possible, all the solutions regarding the planning of the building must be taken into account. For example, the mean annual temperature in Finland is about 4 degrees in Celsius, while in Indonesia it is about 26 degrees. In other words, in Finland energy solutions aim to keep the heat inside the house (i.e., focus on heating) while in Indonesia the main aim is to keep the heat outside the house (i.e., focus on cooling). However, in both cases, insulation plays a major role in addition to the heating/cooling system. Hence, it is obvious that the applications, solutions and their combinations are always more or less site-specific, but the big picture must be kept in mind.

Today, roughly about 70 percent of the world's 6.7 billion people live in the tropics, where the landscape ranges from vast, arid deserts to lush, wet rainforests, and high, cloud covered mountains. Tropical regions are mostly rich in biodiversity and natural energy sources, hence utilization of renewable and sustainable solutions may have a huge market as well as exploitation potential in tropical areas. The most suitable and already utilized renewable energy solutions in tropical areas appears to be at the very least solar power, wave power, biofuels and biomass, geothermal and some hydro solutions (Bugaje, 2006; Hasan et al., 2012). For example, Indonesia consists of 17,000 small and isolated islands where electricity demand is quite low and the energy infrastructure does not necessarily cover all the areas. Solar systems are not usually dependent on the power grid, therefore, rural conditions provide excellent conditions for utilizing solar energy (Hasan et al., 2012).

In sum, the previous discussion points out the fact that the innovations and results gained from the RESCA–project are generalizable and scalable to some extent. It should be remind that not only the wholeness is what matters, but also the local requirements and constraints must be taken into account. But the fact that applies everywhere is the desire to develop and make the difference.

4.2. RESCA's Practical Implications

As long ago as the early 1990's, moisture and mould damage problems were recognized in Finland as a significant problem in the interiors of buildings, one with harmful effects on health. It is known that the defects in construction techniques, planning and maintenance are the gravest contributors to those damages, but an ability to prevent or redress them correctly is still lacking. After a problem has manifested itself, the health problems are not tackled effectively enough and adequate operational models and tools are not available.

Reijula et al. (2012) estimate that in Finland there are serious moisture and mould damage problems in 7–10% of small and row houses, 6-9% in multi-storey apartment blocks, 12–18% in schools and kindergartens, 20-26% in care institutions and 2.5–5% in offices. When it comes to residents and users, 221,000–443,000 people live and work in damaged small and row houses, and 103,000–154,000 in multi-storey blocks. The corresponding numbers for schools and kindergartens are 172,000–259,200, care institutions 36,000–46,800 and offices 27,500–55,000. Many researches have shown evidence that there is a link between the onset and worsening of asthma, cold symptoms, bronchitis and allergic alveolitis ('farmer's lung'), and moisture and mould damage problems.

Moisture and damp damage problems have also imposed significant economic impacts on the society in Finland. For example 6–10% of our national wealth suffers from moisture and mould damage problems, which in monetary terms mean 13–28.2 billion euros. The annual repair costs caused by aforementioned problems are in total 1.2–1.6 billion euros. In addition, the

level of health-related costs are close to 450 million euros, including the costs caused by symptoms, illnesses, examinations, loss of work capacity and lower work productivity. To overcome these problems and limit damages, a constant additional annual input of €50 million would be worthwhile. With that input, even 10% of these problems could be reduced. Also an input of 1.5 billion euros to repair the existing significantly damp- and mould-damaged buildings would pay itself back in three years, as a benefit to the national economy (Reijula et al., 2012).

Although preventing moisture and damp damages were not directly mentioned in RESCA's main objectives, they were still considered carefully. It is worth noting that by taking into account the entire life-cycle of the building from planning to disposal stages, right at the beginning of the project, this recognition has a positive impact on the amount of moisture damages. Furthermore, energy solutions make a fundamental contribution to a building's life-cycle, especially in the case of a green building, where sustainability is the combination of (renewable) energy solutions, architecture (i.e., space planning and orientation), structural solutions (i.e., energy efficiency), and electrical and mechanical solutions. Because sustainability and renewability are about complex and somewhat novel ensembles, the wide scale interaction and collaboration between firms, authorities and research institutes should not be forgotten either.

In addition to aforementioned results, RESCA produced practical information about different renewable energy solutions, comprising *inter alia* feasibility, challenges, expenses and reasonable combinations of those solutions (i.e., hybrid solutions). Although RESCA as a pilot project has already become to an end, the City of Oulu and its supervision of buildings have continued their development activities by implementing best practices in a wider scale through their new development project, "Future buildings and renewable energy" (City of Oulu, 2015). It aims to optimize energy technologies or their combinations and energy efficiency together economically and technically in order to produce functioning solutions. Finally, the City of Oulu spreads useful information, results, etc. both nationally and internationally.

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