

Sustainable Historic Towns

URBAN HERITAGE - GOOD FOR THE CLIMATE!



Project Report 2011-12

Human settlements have constantly adapted to climatic and environmental changes including those resulting from disasters. However, the intensity and speed of present changes are challenging our complex urban environments. Concern for the environment, in particular for water and energy consumption, calls for approaches and new models for urban living, based on ecologically sensitive policies and practices aiming at strengthening sustainability and the quality of urban life. Many of these initiatives, however, should integrate natural and cultural heritage as resources for sustainable development.

Recommendation on the Historic Urban Landscape / Environment #19. Paris, UNESCO May 2011.

http://portal.unesco.org/en/ev.php-URL_ID=48857&URL_DO=DO_TOPIC&URL_SECTION=201.html

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Sustainable Historic Towns: Urban Heritage – Good for the Climate! (2011-12)

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The project has received economic support from the Nordic Council of Ministers.

Cover photo: Rune Nylund Larsen.

Grünerløkka, Oslo inner city: A high density and mixed use urban district with apartment buildings facing the street. Large areas within each block are available for common use.



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PROJECT REPORT 2011-2012





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Preface

This report marks the completion of the project “Sustainable Historic Towns: Urban Heritage – Good for the Climate”! As the main project activity, representatives from Latvia, Estonia, Finland, Sweden and Norway have answered a number of questions, regarding the status of urban heritage assets *as an ecological resource and management challenge* – in their respective countries.

The answers suggest that the policies, principles and number of relevant good-practice examples, vary a great deal from one country to the next. The purpose of the enquiry has not been to expose national differences, but rather, to establish a level of basic information, as a point of departure for further discussions and cooperation.

The project should be seen as a two-part undertaking where this initial report should be followed by a catalogue of good-practice examples. Hopefully, part two can materialize as a project at a later date, since examples of good-practice are a very direct and effective way of promoting awareness and increasing knowledge.

The current project is the result of an initiative by the Working Group “Sustainable Historic Towns” (SuHiTo WG), one of several thematic initiatives by the Monitoring Group of the Baltic Sea Region Cultural Heritage Cooperation. The group was established in 2000, *to identify and address urban development and heritage management challenges in historic towns and built-up areas.*

<http://mg.kpd.lt/LT/16/Sustainable-Historic-Towns.htm>

The sustainability of historic towns and urban heritage interests have been the topic of three SuHiTo projects (see text box on the next page). In the context of this project *urban heritage* is defined as being, *the historical dimension and totality of historical traces of the urban situation (landscape, infrastructure, spaces, building patterns, individual*

Enquiry

1. In reference to the national heritage management system, in what way is the heritage sector involved in developing and promoting good practice (urban) conservation principles, regarding sustainable use and reuse of historic buildings and cultural environments?
2. How have the requirements of EU’s Energy Performance in Buildings Directive (EPBD) and other legislative measures been applied with regard to the architectural heritage, and what are the results - so far?
3. Which (urban) historic building categories are most vulnerable and what are the likely implications if they are, a) upgraded according to EU and/or national environmental standards, and b) not upgraded.
4. What are the long and short term environmental challenges facing the heritage management sector, and what are the associated research needs?
5. What legislative, systemic, management and practical tools are used for analyzing, safeguarding and upgrading historic urban resources?
6. Who are the main target groups (for the project/results of the project)?



constructions), and their ecological footprint.

This perspective has its parallel in UNESCO's definition of the term "historic urban landscape", which states that "the historic urban landscape is the urban area understood as a historic layering of cultural and natural values, extending beyond the notion of "historic center" or "ensemble" to include the broader urban context and its geographical setting".

The SuHiTo WG suggests that the ecological aspect of the urban heritage should be seen as an integral element of holistic urban planning and management, alongside social, economic and technical factors. As a planning and management parameter, the ecological aspect raises new practical and theoretical issues, which can only be addressed through cross-disciplinary discussion and collaboration.

We are grateful for the support and commitment of the Nordic Council of Ministers and project partners. The project has created new professional and personal ties between institutions and individuals in Sweden, Finland, Estonia, Latvia and Norway.



Historic urban landscape. Riga City centre, which has been encircled by a "green belt" of Boulevards, dating back to about 1860. Photo: Arturs Lapins

The Sustainable Historic Towns Working Group: Projects

2003-2005

Sustainable Historic towns: Urban Heritage as an Asset of Development

An Interreg IIIB project, in which the goal was to explore and develop tools and principles for identifying, analyzing and integrating urban heritage resources in urban planning and heritage management processes.

2007-2008

Sustainable Historic Towns: Communicating Heritage in Urban Development Processes.

Co- financed by the Nordic Council of Ministers. The project looks at citizen dialogue as a planning tool and marks the completion of "DIVE", a process for studying development potentials and capacities for change of historic environments.

2011-2012

Sustainable Historic Towns: Urban Heritage – Good for the Climate!

Co-financed by the Nordic Council of Ministers. A short survey of urban heritage as a sustainability issue in management practices and policies. The project may be followed by a part 2, where a catalogue of best-practice examples will be the main focus.



Abstract

The aim of the project “Sustainable Historic Towns: Urban Heritage - Good for the Climate!” has been to look at policies and practices for sustainability in the participating countries, and which challenges and opportunities these represent for management of the cultural heritage. On the basis of the collected information the object was to investigate if there are ways in which the cultural heritage can become a positive resource for sustainable practice, rather than be regarded as a problem, as is often the case with policy makers. In what ways are the cultural heritage "Good for the Climate"?

The aim of this enquiry is to study in which way cultural heritage can be a valuable resource for sustainability; both in the limited sense, as an existing gigantic climate gas storage and valuable resource, and in its wider sense, as a historical document, representing traditional knowledge and examples of how today’s society may cope with resource depletion. If traditional construction methods and materials are respected and included in environmental calculations, and if consultants have knowledge about traditional building methods, the energy performance in buildings directive (EPBD, p. 19) could be an important factor in saving and improving many existing buildings. On the other hand, if attempts are made to improve historic buildings without such knowledge, the results may be both harmful and unhealthy.

Example of a protected and recently renovated government building (NVE). The building has energy level B (low energy level), which shows that it is possible to achieve a considerable reduction in energy use, even in protected buildings. The protection encompasses the outer shell of the building, including interior surfaces and the interior of some parts of the building (board room, an office wing etc.).



Photo: Marte Boro©Riksantikvaren

There is some interesting evidence that principles of modern "Eco-city" planning are very similar to those used in yesteryear’s towns and cities (historical towns). And because principles of sustainability and care for the urban heritage have important factors in common, combining the two can be fruitful in forming the future policies and strategies for safeguarding existing buildings and urban environments.



1. Project background and description

This project is one of many long term efforts aimed at reducing the energy consumption and carbon footprints of built environments, both in reference to the global condition, and more specifically, the European Union's seminal document, "Energy Performance in Buildings Directive" 2010/31/EU (EPBD). According to the UN Intergovernmental Panel on Climate Change (IPCC), climate changes over the last 50 years are the result of human activity. The IPCC emphasizes the importance of the building sector in working towards low carbon economies. According to EU statistics, 35-40% of consumed energy and emitted greenhouse gases are building related. 70-80% of the building stock will still be in use in 2050, including today's historic towns and urban heritage.

Historic towns, which often constitute today's urban centers, have much in common with 21st century sustainable urban planning principles based on reuse, reinvestment, retrofitting and respect. Life cycle studies suggest that demolition and new construction causes larger carbon footprints than those resulting from reuse of urban resources. The indications that favor preservation and reuse should however be followed up by systematic and in depth studies, in order to confirm the claim that safeguarding urban heritage is indeed, "good for the climate".

While other projects have looked at how the consequences of climate change for the cultural heritage can be mitigated, e.g. the Nordic project "The Effects of Climate Change on Cultural Heritage and Historic Environments" (Effekter av klimaendringer på kulturminner og –miljø, 2007-09), the focus of the SuHiTo project is on the urban heritage as an ecological resource in its own right, in addition to its social, cultural and economic attributes. The revisions in national legislations brought about by the Energy Performance in Buildings Directive (EPBD) are changing the design and environmental properties of new buildings and the premises for use and reuse. Urban heritage resources that are not upgraded may in turn become less competitive in the market and vulnerable to detrimental effects of development forces. Following the demands for improved energy efficiency too rigidly, may however cause serious harm to sensitive historical and architectural characteristics, as well as to physical building properties, unless custom designed and gentle approaches are applied.

Project aims

The project wishes to promote the use of good-practice approaches to urban heritage conservation and management, based on a sharing of knowledge and experience. Many urban heritage elements can be relatively simply upgraded to new environmental standards, while other elements are vulnerable and require more advanced and subtle approaches. Listed/protected historic buildings are largely exempt from the requirements of the EPBD if heritage qualities are threatened. However, most of the urban heritage has none or little formal protection, and safeguarding is dependent on the capability and willingness of local communities, owners and commercial interests, to use and reuse their cultural resources.

The situation represents a very real challenge and threat, as new groups of urban buildings are found to be of historical and typological interest, e.g. the large number of 20th century buildings. Safeguarding historically and architecturally significant urban heritage resources, through social,



economic and ecological use/reuse, can only be successful if fully integrated into urban planning and management strategies.

The specific aims of the project description were discussed by project partners at the project kick-off in Oslo in May 2011. The project ambitions were transformed into a feasible format, by formulating them as a set of questions. The national coordinators were then given the responsibility of conducting the enquiry and answering the questions (p.7).

Project organization and activities

The Directorate for Cultural Heritage in Norway has been Lead Partner and responsible for application and reporting procedures to the Nordic Council of Ministers on behalf of the SuHiTo Working Group.

Project Manager: Dag Arne Reinar, Directorate for Cultural Heritage, Norway.

National Coordinators (NC) and Working Group members (WG):

Marte Boro (NC), Ingun Bruskeland Amundsen (WG), both from the Directorate for Cultural Heritage, Norway.

Therese Sonehag (NC), Pål Anders Stensson (NC,WG) Camilla Altahr-Cederberg (WG), all from the National Heritage Board, Sweden.

Özlem Özer-Kemppainen (NC/WG), Oulu University, Faculty of Architecture, Finland.

Kati Männik (NC), SRIK Tartu, Mart Siilvask (WG), National Heritage Board, Estonia.

Arturs Lapins (NC/WG), AIG on behalf of State Heritage Inspection, Latvia.

Project consultant: Frederica Miller, GAIA Architects Oslo

Communications advisor: Odd Iglebæk, editor the Journal of Nordregio 2006-2011

Meeting points

The project has had three international meetings:

Preparatory meeting Stockholm 23-24 Feb. 2010, hosted by the Swedish National Heritage Board.

Project "Kick-off" in Oslo 9-10 May, 2011, hosted by the Norwegian Directorate for Cultural Heritage.

Conclusive meeting in Tartu/Tallinn 23-24 April, 2012, hosted by the Estonian National Heritage Board and SRIK Tartu. Public meeting: Tartu 24 April 2012. Presentations of the project topic and status in Finland, Sweden and Norway.

The project management (lead partner) has met with project consultants, who in turn have had direct contact with the national coordinators etc. The national coordinators and working group members have been responsible at the national level.



2. Urban heritage as an environmental resource

Towards an ecological and holistic view

The cultural heritage sector traditionally regards the historical, cultural and architectural values of objects and environments as primary management criteria. In recent years the importance of the use-value of heritage resources has increased, as historic buildings without functional qualities are difficult to safeguard in a competitive market. When heritage buildings are actively used this generates both interest and resources for preservation. Active use leads us to the question of sustainability; use of existing resources where possible, rather than dependence on new resources is sustainability in action.

Many historic buildings were built in periods with scarce resources, based on traditional energy efficiency principles. This in sharp contrast to current building trends based on technical solutions and energy-intensive processes. In the past materials were locally produced and processed, production required little energy, material properties were utilized well, leaving very modest carbon footprints.

These are good reasons, both for the continued use of older buildings, and the use of traditional knowledge in new buildings. The physical properties and principles of older buildings and building methods can provide useful knowledge in the development of new and more holistic construction techniques. New houses can be built with better insulation resulting in less use of energy, but are nevertheless, a strain on energy and material resources. Recent life cycle studies compare levels of greenhouse gases emitted by existing and new buildings. They show that it may take decades before the carbon footprint of new houses can match or go below those of environmentally upgraded older buildings, even when taking into account the cost of safeguarding cultural and historical values. Today's excessive focus on energy use in the operational phase of a building should therefore be replaced by a more holistic view and life cycle perspective of the total energy use and carbon footprint.

Measures that are supposed to reduce climate change may instead create unintended pressure to convert and/or demolish older buildings and areas of cultural and historical value. Environmental legislation in most countries targets primarily new buildings, as well as major renovations of old buildings. Historic buildings (protected and/or listed) are to a certain extent exempt from the new requirements, but they should be included with a more holistic approach. Although heritage management authorities traditionally focus little on the environmental properties and potential of historic elements, a new awareness and change of attitude is emerging.

In a sustainability context today's focus is largely on individual buildings. Widening the sustainability perspective to include the block and district level introduces new opportunities. Production and use of renewable energy becomes simpler. Measures can be minimized on particularly vulnerable historical buildings and intensified on the less sensitive structures. Measures at the block and district level are economically more viable and easier to manage than numerous individual and small scale solutions. The holistic perspective may be a more demanding approach, but the potential for reducing the carbon footprint and use of scarce resources is accordingly rewarding.



Sustainable historic towns

Sustainable urban planning principles

Existing historical towns and cities are, purely by the fact that they exist, important environmental resources. Therefore, using and reusing the existing built environment gives an environmental advantage. In addition it is possible to look at modern practices of sustainable urban planning and building to see if there are principles and practices where historical examples can be used as inspiration. Towns and cities that were built or planned at a time when resources were scarce can be interesting as models, or examples, of possible strategies for modern resource and environmental efficiency.

Eras that predate car transport can give good examples of principles for sustainable inner cities, or local urban communities. As we reach peak oil many cities have already experienced that a sustainable city must be primarily based on public, pedestrian and bicycle transport. There are increasing numbers of examples of how to keep private car transport out of city centers. Also car and public transport that runs on renewable energy sources is given priority.

If we look at historical cities and buildings to see if, and how, they exemplify principles of sustainability, we can also see how they can become even more sustainable. By doing this it is then possible to identify relevant methods and goals for more research, and important considerations. There is an increasing amount of research and evidence/experience on urban sustainability and sustainable building showing that many historical examples are valuable inspiration for modern, sustainable planning.

In the practice of sustainable building and planning it is important to look at different scales, from the overall urban level, to district level, block and building. They levels are of course connected, but each has its own distinct challenges and solutions. Some themes need to be studied at all levels, and in a holistic approach all themes need to be interconnected.

Sustainable historic towns at the urban and district level

Mixed functions and mixed use

Most modern eco-planning looks at the importance of multifunctional local communities. The main reason is the need to reduce transport, but also to create walkable, safe neighbourhoods, and strengthen the socio-economic community. Planning looks at the street section, from public to semi-public, private and semiprivate areas, encouraging privacy, but also creating safe meeting places and social opportunities, with accessibility for everyone. There are interesting examples of this, in projects with refurbishment of existing urban areas, such as Französisches Viertel in Tübingen, and Vauban in Freiburg, Germany.

Urban density

A city of qualified density is the aim. Such a city is dense enough to reduce transport needs, and also green enough to provide recreational facilities. A strong city centre, and concentrated building around public transport nodes, can utilise existing public transport systems efficiently. A city should function as a network of urban quarters that provide local services, and connect different areas. Spacescape of Sweden have some interesting studies of the new urban area Brøset in Trondheim, Norway.



<http://www.trondheim.kommune.no/gronnbybroset/>
<http://brozed.wordpress.com/br%C3%B8set-a-carbon-neutral-housing-settlement-in-trondheim-norway/>

The Swedish report "Den goda stad" (The good city), shows plans for Jönköping, Norrköping and Uppsala, as examples of some of these aspects. Their strategies include the establishment of "Stadskärnaforeninger" (City centre cooperatives), which are cooperations between shop owners and property owners, based on the reasoning that,

"Experience suggests that one should not build single function enclaves in the city, instead one needs to create a continuous "city web" without barriers, that makes it attractive to cycle or walk. The back bone is an area with access by public transport. Localisation and design of the public transport stations are critical for the cities' main functions. In the city you should be able to live without a car, but there are few good examples! Businesses should be centrally located close to public transport. Having shops and businesses in the first storey, along important routes and at central nodes, is part of the strategy. (In some places it is required). The city block is an often used principle, with parking under the street level. The car has to be removed from the city because it takes too much space." (Nordic Urban Forum/World Urban Forum)

A city of minimal land use reduces the impact on ecological and natural environments, and requires a certain density. Bioclimatic planning means adapting buildings and city areas to local climatic conditions to improve comfort levels. Integrated green areas, in balance with nature are an important ingredient for recreational and biological reasons. Green parks and natural systems should be linked to the surrounding region, and can also be used as important areas for increased biological diversity, local storm-water retention, allotment gardens etc.

Resource efficiency

Resource efficiency, reducing consumption and use of materials, and using environmentally friendly and renewable sources, are important principles, as are the reduction, re-use and recycling of waste at a local level. Decentralized supply and disposal means using locally available resources efficiently, and reducing the need for new resources.

Holistic planning tools

Increasingly, different tools are being used to establish a more holistic understanding of how sustainable different strategies and elements are in the planning and building of areas. Examples of these are LCA Life Cycle Analysis, and Ecological Foot Print (used for the city of Oslo). International tools that are coming to Scandinavia are BREEAM from Great Britain (British Research Establishments Environmental Assessment Method); BREEAM NOR, Norge, www.ngbc.no; LEED – USA Leadership in Energy and Environmental Design from the US Green Building Council www.usgbc.org, www.lead.net; DGNB from the German sustainable building council – Germany www.dgnb.de; ECO-QUANTUM – Holland, www.ivam.uva.nl; www.w-e.nl; and GREEN STAR – Australia www.gbca.org.au. These systems vary in which areas they focus on, but are useful tools to look at as checklists on environmental criteria.



Urban scale

A city of human scale and urbanity, with good public spaces is attractive and encourages people to stay in the local area. There are many historical examples of wonderful people friendly city centers, that are sustainable in the sense that they have survived and shown adaptability, and popularity through many years, changing cultural values and historical periods. We have only to mention places like Paris, Bath, many Italian towns, and towns in the countries taking part in this project. The work of the urban planner Jan Gehl in Denmark continues these traditions in modern city planning.

www.gehlarchitects.com. A city for public transport, cyclists and pedestrians, that is walkable, with short distances, implies a small human scale. Greater density in the inner city requires better planned cities, with a focus on the human scale. There are examples such as Hasselt in Belgium where public transport is free in the inner city zone, and Copenhagen where cycling and pedestrian areas solve a high percentage of the public transport needs.



Vulkan is one of the old industrial areas in Oslo presently undergoing change. The old industrial buildings have been given new functions next to a new hotel, offices and residential buildings. A new power plant (in the central building) provides energy for heating and cooling based on geothermal heat pump technology. Buildings are also cooled by ventilation and solar panels provide hot tap water. New buildings are well insulated and have a low energy consumption. The power plant produces 29 GWH of pollution free energy. This is an example of an urban development at district/block level, based on local production of renewable energy, refurbishing old buildings with a minimal impact on structures and facades, and new buildings balancing the total energy need by using very little energy. Photo: Terje Løchen

Sustainable historic towns at block and building level

Adaption to the climate - how buildings are sited, their orientation and built form.

Compact buildings have, because of their shape, better energy efficiency than for example high rise buildings with large outer wall areas. Good sustainable design uses passive solutions as far as possible, with passive solar use, and heat retention in heavy building mass. An example is Grünerløkka in Oslo



(see front cover photo), an urban area of high density and good communications along streets with shops and public services. Large areas are central, rather than nodes where traffic has a tendency to be congested. Low buildings allow the sun to enter streets and back yards. Flats have general plans that are flexible and still work well 100 years after being built. Large blocks (for example near Kirkeveien in Oslo) provide fine living areas, with all the zones from private to public. Monica Andersson has as her hypothesis in her PhD thesis "Politics and Urban Planning. Modernism in Building Legislation", that:

"The low and dense city, that was built between 1900 and 1930 is the most sustainable that has been built, with its large blocks and garden cities. They were built with mixed use near public transport, and are still just as popular."

Climate gas accounting

Buildings that are already built have a considerable value as carbon and resource storage. Tools to assess the carbon footprint of projects are: Statsbygg's klimagassregnskap:

<http://www.klimagassregnskap.no/>

Using this as a tool the Norwegian Directorate for Cultural Heritage commissioned a report to estimate what produces the least carbon emissions, renovating an existing timber building or tearing it down and replacing it with a modern energy efficient building. The report on Bakklandet shows that renovation produces least climate gases.

<http://www.riksantikvaren.no/?module=Articles;action=Article.publicShow;ID=130453>

This also ties up with other Norwegian and international studies that show that new buildings are seldom a better alternative than refurbishing existing buildings. The most extensive study we have found is done by The Preservation Green Lab, the National Trust for Historic Preservation in the USA, who's report, "The Greenest Building: Quantifying the Environmental Value of Building Reuse", shows that in almost all building categories refurbishment is a more environmentally sound solution.

http://www.preservationnation.org/information-center/sustainable-communities/sustainability/green-lab/lca/The_Greenest_Building_Exec_Summary.pdf

A Dutch report called "Sustainable Neighbourhood Transformation", by [Vincent Gruis](#), [Henk Visscher](#), [R. J. Kleinhans](#), also supports these results, and includes an assessment of the social and economical aspects as well as the environmental aspects. In their book they examine the effects of demolition and replacement strategies on sustainability from an economic perspective: the market position and value of the neighbourhoods; from a social perspective: the levels of social capital and residential stability; and from an environmental perspective: the energy efficiency and use of materials in restructuring strategies.

<http://books.google.no/books?id=FgCJOpxhscC&pg=PT142&lpg=PT142&dq=ECO-Quantum+sustainable+neighbourhood&source=bl&ots=vdD6fEzYqF&sig=dRc5h6Z1mgxhz2xbwyyfohZF-yQ&hl=no&sa=X&ei=73noT7LGO8Xf4QSB5rTEAQ&sqi=2&ved=0CEoQ6AEwAA#v=onepage&q&f=false>



Sustainable historic towns at the building level

Energy - the use of renewable energy sources like wood

Energy efficient heating systems for wood are for example "Finnish stoves" (kakkelovn, which is actually a Swedish invention, kakelugn, from 1767). These ovens are still amongst the most efficient wood stoves, with low pollution and an extremely efficient use of the heat energy in wood.

Plan adaptability

Flexible floor plans. A study of brick apartment buildings from the 1890s shows that general plans have a high level of adaptability and are extremely flexible. Something that increases their sustainability. (Bendik Manum: Apartment Layouts and Domestic Life; Interior Space and its usability. PhD, Oslo School of Architecture 2006.)

Reuse of existing windows - compared with exchanging for new highly insulated windows
The Raadvad Center in Denmark has made a report showing that repairing existing windows can be a sustainable alternative to putting in new windows.

<http://www.bygningsbevaring.dk/files/Vintab12slutrapport2.pdf>

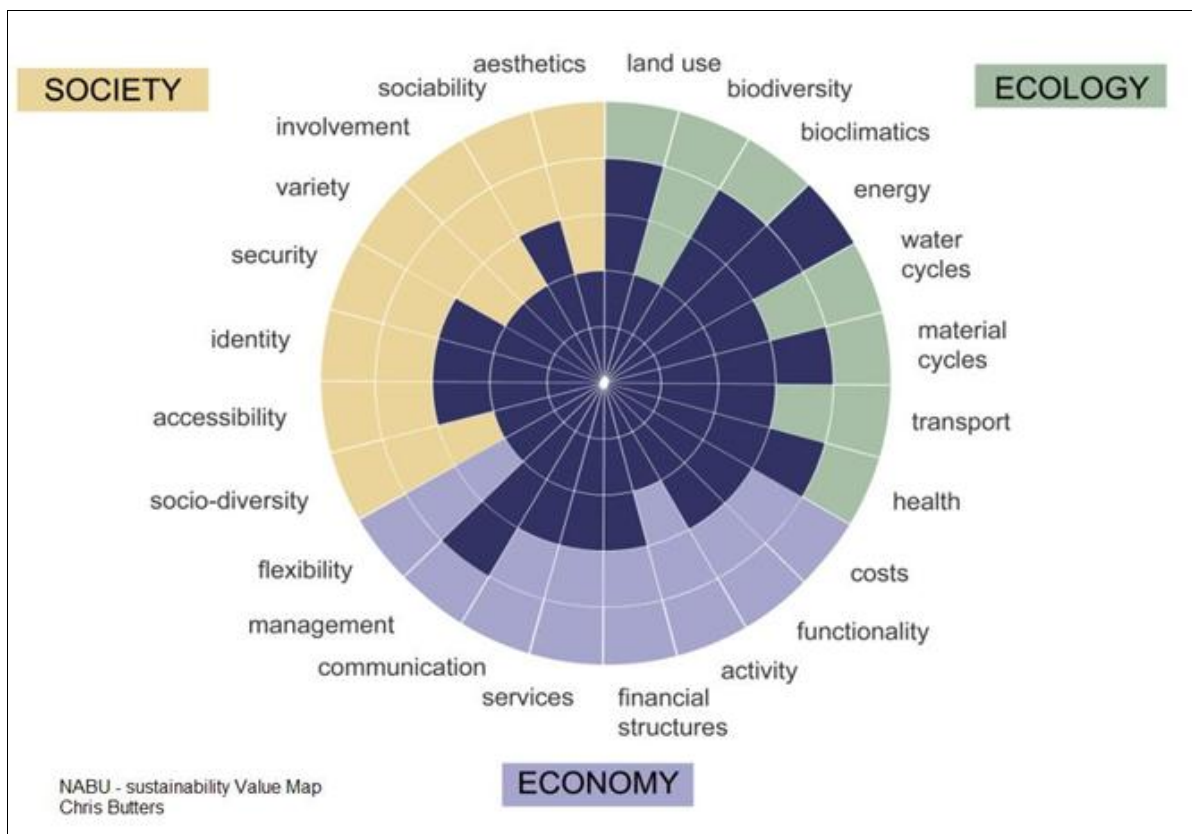
Also the Directorate for Cultural Heritage in Norway has commissioned a report to evaluate the real U-value of different types of older windows.

<http://www.riksantikvaren.no/?module=Articles;action=Article.publicShow;ID=134771>

Healthy indoor climate

The importance of having moisture transfusive walls, hygroscopic materials, and healthy materials with few chemicals improves indoor climate conditions. Traditional materials, often local renewable materials, were often pollution free, with a low carbon footprint.





Sustainability value map. Chris Butters.
Example of a holistic sustainability approach/tool, which can also be used for the management of cultural heritage resources at different urban levels.



3. Summary of results and recommendations

Sustainability practices and policies in the participating countries

The project *Sustainable Historic Towns: Urban Heritage - Good for the Climate*'s main goal is first of all to find out what policies and practices for sustainability are being used in the participating countries and which challenges and opportunities these represent for the cultural heritage. On the basis of this initial enquiry the object is to find out if there are ways in which the cultural heritage can become a positive resource for sustainable practice rather than a difficult problem. ***In what way is the urban cultural heritage "Good for the Climate?"***

Through the survey it has become clear that the introduction of the EPBD (EU's Energy Performance in Buildings Directive), with its focus on energy efficiency, has uncovered many challenges facing the refurbishment of the cultural heritage. Lack of qualified expertise, lack of crafts skills, trying to turn old moisture open buildings into air tight modern buildings, destruction of valuable detailing and the aesthetics connected to different historical periods, lack of funds etc. These are challenges which all the countries identify and are beginning to address. However because of the introduction of the EPBD there are also many new opportunities, and a possibility for new ways of viewing the cultural heritage.

For example - we know that most old buildings, if subjected to a theoretical energy efficiency calculation, will come out very poorly. A simple conclusion is therefore to say that all old buildings have to be retrofitted with more insulation, air tight structures, new windows and mechanical ventilation systems - complying with the current trend of the passive house standard.

Annex B – Extract of DIRECTIVE 2010/31/EU of 19 May 2010 on the energy performance of buildings.

Article 1. Subject matter.

1. This directive promotes the improvement of the energy performance of buildings within the Union, taking into account outdoor climatic and local conditions, as well as indoor climate requirements and cost-effectiveness.

Article 4. Setting of minimum energy performance requirements.

2. Member States may decide not to set or apply the requirements referred to in paragraph 1 to the following categories of buildings:

- (a) buildings officially protected as part of a designated environment or because of their special architectural or historical merit, in so far as compliance with certain minimum energy performance requirements would unacceptably alter their character or appearance;
- (b) buildings used as places of worship and for religious activities;

Article 7. Existing buildings

Member States shall encourage, in relation to buildings undergoing major renovation, the consideration and taking into account of high-efficiency alternative systems, as referred to in Article 6(1), in so far as this is technically, functionally and economically feasible.



However, if we take a more critical, wider view, we can approach this in many different ways. On the level of the buildings structure we can ask, as the Directorate for the Cultural Heritage in Norway is doing, whether a theoretical U-value calculation is really correct for existing walls and windows? And, as many of the SuHiTo partners are beginning to ask: Are there ways of reducing fossil fuel use in existing buildings without destroying significant historical and architectural qualities?

Also, going back to the origin of the EPBD, we can look at existing buildings and ask, what is their value in a Life Cycle Analysis (LCA) perspective, if we take into account climate gas emissions? At both an urban and building level we can ask if the cultural heritage has anything to teach us about sustainable practice?

In most countries, at a national level, there is a clear understanding that the cultural heritage represents an important resource for cultural identity, and on an economic level, that the heritage of course is an important asset that attracts visitors, generates tourism and provides income. This understanding however is in practice often limited to the protection of a few listed buildings and town areas, and does not take into account the wider urban context these buildings are a part of.

Through the new challenge of climate change and Peak Oil we can maybe take this opportunity to link the clear understanding of the value of the cultural heritage at a national level with improved sustainable practice at a local level.

As Sweden so rightly points out regarding the EPBD, ***"Energy audits could be used to actually preserve historical buildings, if the law could be changed with stricter requirements for the qualifications of the energy auditors, so that proposals are made with a building conservator or qualified professional"***.

The key factor in this is that ***instead of regarding the cultural heritage as a problem we turn around and begin to look at it as a valuable resource for sustainability. In the limited sense, existing buildings and towns represent a gigantic climate gas storage and valuable existing resource; in the wider sense, cultural heritage resources provide us with traditional wisdom and examples of how we as a society can cope with resource depletion and peak oil.***



Short summary of the 6 questions asked of the participating countries

QUESTION 1

In reference to the national heritage management system, in what way is the heritage sector involved in developing and promoting good practice (urban) conservation principles, regarding sustainable use and reuse of historic buildings and cultural environments?

On the urban level only two countries have any relevant programs. These however are general programs that do not specifically address the situation of existing historical built environments.

Most of the legislation is geared to listed heritage buildings and not so much to built environments. Apart from single listed buildings the heritage management sectors do not seem to have much influence.

There are some interesting programs that specifically address the issue of energy efficiency, and some information on good practical ways of meeting energy requirements. These programs appear to be focused on conventional energy efficiency measures, rather than a broader approach to sustainability.

QUESTION 2

How have the requirements of EU's Energy Performance in Buildings Directive (EPBD) and other legislative measures been applied with regard to the architectural heritage, and what are the results - so far?

In all countries listed buildings, here understood as cultural heritage buildings that have a protected status at the national level, are exempt from energy efficiency measures to the extent that they do not destroy significant cultural heritage values. However all countries regard the implementation of energy efficiency measures as a challenge for several reasons. If energy efficiency measures aren't carried out heritage buildings may decrease in value, become unpopular, and technically deteriorate. Poor or badly executed refurbishments can destroy heritage qualities in non-listed (unprotected) buildings.

All countries have problems with a lack of qualified expertise and knowledge on good energy efficiency practice for existing buildings, and identify a need for more research. In addition several countries identify the need for a more holistic and diverse approach to energy efficiency measures.



QUESTION 3

Which (urban) historic building categories are most vulnerable and what are the likely implications if, a) Upgraded according to EU and/or national environmental standards, and b) Not upgraded.

Most countries believe that all historic building categories are under threat, and that especially non-listed buildings are threatened. The lack of knowledge about good solutions, a lack of expertise, and imposing modern solutions on historical buildings, are identified by all as challenges.

a) Conventional energy efficiency measures do not take into account traditional building principles and materials. There are some examples of bad energy upgradings that have destroyed the original building fabric technically and/or its historical value. Imposing modern building solutions like MVHR (Mechanical Ventilation with Heat Recovery) and air tightness are seen to be part of the problem.

b) Not upgrading buildings is not seen as a solution either, as buildings may in the worst case be abandoned or left to deteriorate, which will also destroy valuable heritage.

QUESTION 4

What are the long and short term environmental challenges facing the heritage management sector and what are the associated research needs?

Challenges are:

A. Climate change,

- the need to reduce CO₂ emissions,
- the actual effects of climate change with more extreme weather, storms, rising sea levels and increased moisture and moisture related damage (Climate Change and Cultural Heritage in the Nordic Countries. TemaNord 2010:599).

B. High energy use and prices, reducing the use of non-renewable energy sources, not refurbishing existing buildings, or refurbishing them in a way that destroys or reduces their historical value.

There is a need for:

- New methodology, introducing more holistic methods of assessment, e.g. LCA analysis tools.
- Examining conventional theoretical tools - compared to real evidence, e.g. U-values of existing structures.
- Research on technical solutions that respect historical methods and building physics.
- A general need for education of consultants in this field of knowledge.



QUESTION 5

What legislative, systemic, management and practical tools are used for analyzing, safeguarding and upgrading historic urban resources?

All countries have public institutions and legislation that safeguards listed buildings identified as National Heritage. However the practical application of protective legislation of valuable buildings is often the responsibility of local municipalities, including those protected by Planning and Building Laws. Most countries have a database mapping system for listed buildings to help local municipalities. Many countries have economic incentives, such as a system of property tax reduction for historic buildings.

Other valuable cultural and historical areas and buildings that are not protected (listed) have a more uncertain status. These historical areas and buildings often rely on political good will, and the varying competence of local municipalities, private owners and/or institutions, consultants and craftsmen, some with insufficient expertise to avoid unfortunate development.

As for the administration of the EU energy efficiency measures, they are completely separate from heritage management in all countries. The cultural heritage management sectors in the respective countries have not been involved in forming these policies, and seem in many cases rather to have had to oppose the suggested measures due to inadequate regard for historical and cultural qualities.

QUESTION 6

Who are the main target groups (for the project and results)?

Target groups are primarily professionals involved in the cultural heritage sector at a national and regional level. Secondly, all those responsible for heritage management. (Property managers, owners of existing houses, architects, engineers and developers, energy auditors and energy experts, local and regional authorities). And finally of course, the general public.



Recommendations

The study has had an ambitious set of goals. Yet, within the time and resources available in the project, the findings in this initial survey are very interesting, and useful, as a basis for more in depth projects. Not only does the uncovered information, but also the lack of information in some areas, show great potential, if the project is continued.

Recommendations at building level

The project has shown that there is a considerable amount of work being done in all countries as a result of the introduction of the EPBD. However the EPBD has as its main focus improving the energy efficiency of buildings. The motivation for introducing energy efficiency measures is fundamentally to reduce carbon emissions (including all gases that have an effect on the climate). Unfortunately there is strong evidence that a narrow focus only on energy efficiency may not be a sensible approach to reducing the carbon emissions of existing buildings. ***There are many interesting international studies that focus on more holistic LCA analysis, that show that refurbishment of existing buildings can in itself be a good strategy for reducing carbon emissions.*** So far only the Directorate for Cultural Heritage in Norway, of the partner countries, has in its commissioned study of Baklandet, shown that this seems to be the case. There is however a strong need to research sources and studies from other countries and also to initiate more studies in the member countries. We have for example recently found an extensive study from the USA referred to on page 16: "The Greenest Building: Quantifying the Environmental Value of Building Reuse", which shows that in almost all building categories refurbishment is a more environmentally sound solution, and there are most certainly many other such reports.

The EPBD does have the possibility for improving renovation practice.

If traditional construction methods and materials are respected and included, and if consultants have knowledge about traditional building methods, the EPBD could be an important factor in saving and improving many existing buildings.

This possibility raises the importance of qualified expertise, something that all countries seem to find lacking or in short supply. Therefore strategies for improving education, raising the general level of



The carbon emission from a traditional town house, Nedre Baklandet 33, Trondheim, is favorable in a life cycle perspective, when compared to a new low-energy house. Study commissioned by the Norwegian Directorate for Cultural Heritage, 2010.



knowledge about old buildings and construction methods is critical. But increasing the amount of qualified expertise and knowledge, may in some cases also entail a change in attitude to former building practices.

Interestingly there are solutions to energy efficient renovation that are more a continuation and improvement of traditional practices. These recommend moisture diffusive structures, local renewable, healthy materials, natural ventilation techniques, heating with local renewable energy sources, and a bioclimatic design approach. This approach should be further researched and developed.

Recommendations at an urban, district and block level

Surprisingly there seems to be much less focus on urban, district or block levels in cities. There are some examples of urban renovation projects with a focus on sustainability. The existing evidence found suggests that the potential scope of the urban, district and block level to provide sustainable solutions is very large. There is much evidence that our hypothesis - sustainable historical towns - good for the climate - is sound. However to be able to properly prove this requires further research and development. This can take different approaches.

Firstly a study of the urban planning principles of historic towns that have been built and planned in historical eras with a shortage of resources can be most interesting, because as our modern society faces the challenges of reducing carbon emissions and fossil fuel use we will again have to economise on resource use. How resources were used, and how this has formed our urban environments can be an important source of knowledge for future urban planning practice. ***There is some evidence that many principles used in modern "Eco-city" planning are the same as those used in historical towns. Many of the traditional principles of city planning such as mixed use etc. are having a renaissance.*** We suggest therefore that a thorough understanding of traditional urban planning principles can be very useful in the planning of new sustainable neighbourhoods. There are also many existing towns and cities that are already good examples of a sustainable city, so a further study of good existing examples would be necessary.

Secondly, there are now some examples of how existing historical towns are being improved to become more sustainable. The examples we have found in this initial phase show that there are many projects that can be excellent case studies. A more critical evaluation of such projects could give valuable information on good and bad practices for sustainable urban renovation.

Finally, our study shows that ***sustainability and care for the cultural heritage has many important factors in common. An approach that has this combination can be fruitful in forming the future policies of national, regional and local government for existing buildings and urban environments.*** We would therefore recommend a continued study of these factors.

The project has shown that there are many interesting projects and studies at all levels, which could be valuable resources for the continued development of principles for sustainable urban building and planning. Finding these would require more research and an evaluation of good examples.





An example of richly decorated brick buildings that cannot be insulated externally without destroying their architectural qualities. Backyard facades and end walls often have less architectural detailing and can more easily be insulated. Blocks with brick apartment buildings can be an ideal scale for the local production of renewable energy. Photo: Marte Boro©Riksantikvaren



4. Appendix: Results of the enquiry

Complete answers to the questions, references and literature.

Estonia

Finland

Latvia

Norway

Sweden





Estonia

1. In what way is the heritage sector involved in developing and promoting good practice (urban) conservation principles, regarding sustainable use and reuse of historic buildings and cultural environments in reference to the national heritage management system?

On the state level the National Heritage Board has the supervision and management of listed monuments and sites. The Ministry of Culture has several supporting programs for churches, schools, manor houses and museums. The Ministry of Economy and Communications (MKM) has all other kinds of buildings, and the foundation "Kredex" deals with the use of EU funds. The Ministry of Inner Affairs has planning and building. Riigi Kinnisvara Aktsiaselts, is the state property manager. The Ministry of the Environment is responsible for natural monuments and sites, environments and landscapes. The Ministry of Education covers skills, schools, universities and scientific Institutions.

At a provincial level the Heritage Board Offices, Regional Government Offices (Maavalitsused), are responsible for museums.

At the local level there are Municipal offices and authorities: Tallinna Kultuuriväärtuste Amet, Tartu kultuuriväärtuste Teenistus, Haapsalu, Pärnu, Viljandi architectural offices etc.

The Heritage conservation act can be found here:

<http://www.legaltext.ee/et/andmebaas/tekst.asp?loc=text&dok=X60022K2&keel=en&pg=1&ptyyp=RT&tyyp=X&query=muinsuskaitse>

and the building Act here: <https://www.riigiteataja.ee/akt/13277804>

The Building Act stipulates requirements for buildings, building materials, building plans and planning process, the construction and use of buildings. §3 stipulates the requirements for the buildings. Sections 7, 7¹ and 7² contain the requirements related to energy efficiency (minimum requirements). Section 7¹ specifies that these requirements do not apply to cultural heritage buildings and buildings under 1000m². The building regulations do not therefore have impact on the energy efficiency of historical buildings.

The links between climate protection and cultural heritage in Estonia have not been discussed so far. Energy mark (energiamärgis = EPBD) certifies the energy need of the planned building or actual energy usage of existing buildings. Energy mark has classes A to G depending on the energy efficiency of the building. The energy mark has to be submitted with building plans to local authorities to receive a building permit. Energy mark is also required for selling and letting properties. Energy



audits clarify the energy use of the building and gives an idea of the possible measures for energy saving in building.

The planning act – general plan, zone plan, detail plan is found here:

<https://www.riigiteataja.ee/akt/13325415>

There is no well coordinated system for managing the built heritage. Only listed buildings and sites have to be maintained according to the Heritage law. According to the planning act the municipalities can give regulations for historical areas – "environmentally valuable areas" (Miljööväärtuslikud hoonestusalad). These are mostly wooden building areas around town centres – areas which are under pressure of gentrification. Historic buildings outside regulated areas are not protected and their protection depends on the owner. There are practically no existing support systems for private owners.

NGO level: Sustainable Renovation Centres in Tallinn, Tartu, Viljandi, Paide (www.srik.ee; www.renoveeri.net) – are organizations that are based on voluntary work, and are project based (except Tallinn and Paide centres). Their main aim is to give support, and organize workshops for owners and people who appreciate traditional materials and working skills.

Eesti Muinsuskaitse Selts - The Estonian Heritage Society, established in 1987, started off as a strong national movement, followed by the establishment of various heritage clubs and societies. The democratic structure of the EMS has self-managed divisions, and is independent of political power. In the early years EMS had ca 10 000 members. At present EMS is the umbrella for 53 voluntary organisations researching and protecting cultural heritage, including local community societies as Suplinna Selts, Karlova Selts in Tartu, Uue-Maailma Selts in Tallinn.

2) How have the requirements of EU's Energy Performance in Buildings Directive (EPBD) and other legislative measures been applied with regard to the architectural heritage, and what are the results - so far?

According to the context of EPBD most of the buildings in Estonia are energy inefficient. According to the information from the Ministry of the Environment of Finland, Estonia uses two to three times more energy than the Nordic countries, even though the average temperature is higher. Based on the EU directive on energy efficiency for buildings, Estonia has the obligation to develop and implement measures to make the use of energy more efficient in existing buildings.

Estonia has been successful in selling AAU's (Assigned Amount Units). Under a Green Investment Scheme the proceeds will be invested into energy efficiency improvement of local and central government buildings – in total 480 buildings in 2011/2012.



3) Which (urban) historic building categories are most vulnerable and what are the likely implications if, a) upgraded according to EU and/or national environmental standards, and b) Not upgraded.

There are 4 categories of historic buildings:

- 1) National monuments - about 5000 buildings.
- 2) The buildings in the heritage conservation areas, mainly the town centres, 10 areas: Tallinn, Tartu, Pärnu, Viljandi, Kuressaare, Haapsalu, Võru, Valga, Tõrva, about 6000 buildings, the inventory is ongoing.
- 3) Buildings in areas of environmental value, mainly town areas, with wooden housing;
- 4) Buildings outside the environmental areas without any legal protection.

In fact all heritage categories are under threat because of a lack of management. National monuments are managed by their owners. According to the heritage law, they can get some support from the government, but the support has been decreased to a minimum during the last years.

The most vulnerable category is architecture from the 20th century (registration is still going on). Architecture from the 50`s and buildings outside towns, in countryside areas are most vulnerable. The reason is because of poor construction quality and materials, and a lack of knowledge and appreciation of contemporary housing.

There is some evidence of a negative impact from the upgrading of this category, using poor working skills and materials. The main problem is the public pressure to make the building stock more energy efficient without considering historical/traditional materials, working skills and appearance.

Our conclusion is that all heritage categories are vulnerable because of a lack of management. There is some evidence of a negative impact of energy upgrading without considering cultural values.

4) What are the long and short term environmental challenges facing the heritage management sector and what are the associated research needs?

Main issues are the lack of qualified knowledge and experience. Short term challenges are to work out and develop concepts and guidelines for the heritage sector for local authorities, owners, architects and engineers. To work out methodologies and build up working systems of professional consulting and management for all categories of the buildings.

Long term challenges are to implement concepts and qualified knowledge in real life. All building categories can be maintained methodologically, the processes controlled, the owners given consultation and supported.



5) What legislative, systemic, management and practical tools are used for analyzing, safeguarding and upgrading historic urban resources?

The Ministry of Culture is responsible for cultural heritage issue related policies (Cultural Heritage Department). The Heritage Conservation Advisory Panel makes proposals and evaluates all issues arising from the Heritage Conservation Act. The opinions of the Advisory Panel constitute the recommended basis for the National Heritage Board and local governments in the planning of heritage conservation work and the elaboration of heritage conservation principles. The Advisory Panel submits its opinions and records decisions in writing to the Minister of Culture and the National Heritage Board. The National Heritage Board organizes heritage conservation work, exercises state supervision over monuments and heritage conservation areas, and maintains the national register of cultural monuments.

Rural municipalities and city governments have the following responsibilities regarding cultural heritage issues stipulated in the Heritage Conservation Act:

- To maintain records on immovable monuments in their territory.
- To take into consideration the heritage conservation requirements arising from immovable monuments, heritage conservation areas and their protected zones when preparing and coordinating physical planning, land use and other documentation, and when establishing traffic control.
- To make proposals to the National Heritage Board to place things of cultural value under temporary protection.
- To monitor whether persons who conduct work involving monuments hold research permits and activity licences issued for the established procedure.
- To monitor whether work involving monuments, their protected zones and structures located within heritage conservation areas and the relevant plans have been approved by the National Heritage Board.
- To promptly inform the National Heritage Board of any violations of the Heritage Conservation Act, alterations resulting in damage to monuments, and findings of cultural value.
- To suspend work and other activities which endanger monuments or findings of cultural value.
- To perform other tasks arising from the statutes of heritage conservation areas.

The Ministry of Economic Affairs and Communications is responsible for energy and housing related policies (Energy Department).

The regulation 258 “Energy efficiency minimum requirements” is based on the § 3 section 7² of the Building law. §3 of the building law stipulates that the energy efficiency minimum requirements are not applicable to cultural heritage buildings. Therefore there are no specific national rules concerning the energy performance in the built heritage.

In 2006 the Energy Efficiency Centre of Excellence – the unit providing education in the field of energy efficiency of apartment buildings - was established at the SA KredEx: “Estonian Environmental



Strategy Until 2030” (responsibility of the Ministry of the Environment). The aim of the SA KredEx is to improve the housing conditions of Estonian inhabitants by expanding financing possibilities and offering financial solutions aimed at energy efficiency. mirja.adler@kredex.ee

Financial mechanisms (available via the state agency KredEx) are:

- Support for the renovation of apartment buildings to increase the energy efficiency and improve the energy mark level

<http://www.kredex.ee/korterelamute-rekonstrueerimistoetus>

- Support for the energy audit, building expertise and building projects for reconstruction works based on energy audit mainly for apartment buildings (<http://www.kredex.ee/10883>).

- Support for developing expert advice for houses in the areas with a valuable environment, to evaluate the architectural and cultural value of the building, its technical condition, and for making preliminary suggestions for renovation and maintenance

<http://www.kredex.ee/10880>

Increasing awareness of energy efficiency and the integration of energy efficiency with other sectors of the economy have both been the main objectives in terms of developing energy efficiency and implementing regulations and support. These trends are directly reflected in the Energy Efficiency Plan.

“Estonian Housing Development Plan 2008-2013”

http://www.kredex.ee/public/Eluasemevaldkonna_arengukava_eng_19.09.2008.pdf

„ National energy efficiency plan 2007-2012“

According to expert opinion, it is possible to achieve an average 20-30% energy saving as a result of proper reconstruction and renovation work in an apartment building. Financial saving for Estonia as a whole may reach 0.5 billion EEK per year. Therefore, combining reconstruction support initiatives with the energy saving agenda is important for improving accommodation standards, as well as decreasing maintenance costs for the housing budget. The priorities would be to educate residents in the field of energy efficiency, to carry out energy audits and to support the energy-efficient renovation of apartment buildings. These objectives are also of significant importance in this Energy Efficiency Plan. Estonia has developed a number of measures financed from public funds and with the objective to increase energy efficiency. These public funds receive their income from energy excises, pollution charges, EU structural funds and bilateral aid schemes. Also options for sales of AAUs are explored as a potential source of income to fund energy efficiency measures. 480 public houses will be renovated during 2011/2012 from the successful sale of AAU's.

The most notable energy efficiency measures benefitting from public funds are: grants for energy efficient renovation of residential buildings (multi-apartment buildings); support to energy audits in multi-apartment buildings; grants for the reconstruction of district heating infrastructure (boilerhouses and networks); support to local governments to upgrade local infrastructure (public buildings, street lighting); support scheme for construction of new public low-energy buildings or



renovation of existing buildings with the aim to meet low-energy building standards after the renovation.

Besides the measures described in the National Energy Efficiency Action Plan there are some measures which are not described in the ESD or in any other national policy document, but that have an effect on energy consumption and are delivering energy savings, eg. - tax relief on interest paid for home renovation loans. This instrument is for private people when they renovate their homes and borrow from a bank, the interest may be deducted from their income. This strategy has helped to renew existing individual houses and has also supported the construction of new apartment buildings. In addition there is tax relief for reinvested profit in businesses. All businesses may deduct reinvested profit from their income in their income tax declaration. Businesses reinvest their profit in new equipment that is often more energy efficient.

There have been several surveys supported by Kredex. The energy efficiency demands do not consider housing under 1000 m². There have been several technological problems in realizing the EU demands in practice. 96% of the buildings are owned by the private sector. The survey of wooden buildings was published in June 2011. The results are that about 95% of the buildings are not matching the energy performance criteria and need to be reconstructed. The studies recognize the need for insulation of the buildings, but do not provide specific guidance on how to insulate the buildings of historical value without changing the appearance and original details of the buildings. As there aren't any methodological guidelines and recipes, the process continues spontaneously.

The survey called "Indoor Climate, Constructional Physics and Energy Efficiency of Country Houses" focused on log houses built before the Second World War, which were mainly located in country areas. The main problem of log houses is the insufficient heat and air retention of shells; damage to the shells due to rot, excessive moisture and microbiological growth; and damage to joints. In 92% of the examined country houses, the indoor temperature did not meet the lower limit values of the indoor climate standard. The reason for low temperatures was both insufficient heat retention of the shells and an inefficient heating system. The inhabitants questioned were most disturbed by uneven indoor temperatures and cold floors due to heating by stoves.

According to Targo Kalamees, Professor of the Tallinn Technical University, the focus in Estonia has lately been to support the examination and renovation of apartment buildings. "The present survey showed that new awareness needs to be created, and there is also a need to examine the state and development of renovation solutions for other building types". According to scientists, it is possible to improve the general energy efficiency of an old country house by one third without spoiling the atmosphere, and decrease the heating energy cost by 40%. The survey gives a thorough overview of possible renovation solutions for country houses. A survey about brick houses is also available.

6) Who are the target groups (for the project and results)?

The principal target group is the owners of existing houses, Local authorities (municipalities, provinces); Architects, engineers and developers.



References and literature

<http://www.legaltext.ee/et/andmebaas/tekst.asp?loc=text&dok=X60022K2&keel=en&pg=1&ptyyp=RT&tyyp=X&query=muinsuskaitse>

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Estonian Housing Development Plan 2008-2013

http://www.kredex.ee/public/Eluasemevaldkonna_arengukava_eng_19.09.2008.pdf

www.kredex.ee





Finland

1. In what way is the heritage sector involved in developing and promoting good practice (urban) conservation principles, regarding sustainable use and reuse of historic buildings and cultural environments in reference to the national heritage management system?

According to "The land-use and building act of Finland (132/1999)", buildings or streetscapes with historical or architectural value may not be damaged and renovation must take into account the properties and special features of buildings. However the act does not elaborate on this.

The local authorities in Finland supervise land use planning; construction and demolition work; and are also responsible for an increasing awareness of the cultural environment. The local authorities also own many historically significant heritage sites.

The Ministry of the Environment prepares legislation, policies and programmes related to Finland's cultural landscapes and architectural heritage, and is also responsible for monitoring the state of cultural environments and supporting the management of heritage sites and landscapes.

<http://www.ymparisto.fi/default.asp?node=21383&lan=en>

The Land Use and Building Act

Finland's National Building Code

Preserving built heritage and cultural landscapes

The regional environment centres supervise planning to ensure that local plans safeguard nationally significant sites.

The environmental administration works closely with Finland's **National Board of Antiquities** (NBA) on issues related to cultural landscapes and architectural heritage.

<http://www.nba.fi/en/index>

The National Board of Antiquities also has special responsibility for managing archaeological remains, and is supervised by the arts and cultural heritage unit of the Ministry of Education, who are also responsible for other issues related to cultural heritage.

http://www.minedu.fi/OPM/Julkaisut/2003/kulttuuriperinto_tietoyhteiskunnassa_strategiset_tavoitteet_ja?lang=en



The National Board of Antiquities administers the protected buildings and environments. It officially participates in some experimental and pilot projects to improve the energy efficiency of the protected buildings. However the NBA does not have any separate budget for conducting its own research or experimental projects. The NBA does not have any inspectors or engineers for supervising the sustainable restoration and reparation of old buildings or heating, plumbing, ventilation and sanitation engineering work, which aims to improve the energy efficiency of old, buildings.

The NBA also follows rehabilitation research projects of research centres and universities, which are financed by Tekes (the Finnish funding agency for Technology and Innovation) without having a decisive role. These projects are not usually concerned with the historically significant buildings.

The opinion of the NBA influences the sustainability and energy efficiency of restoration projects, such as wind parks in regional plans, planning in general and the restoration of single buildings.

The Ministry of Agriculture and Forestry controls and develops the built environment in rural areas, including construction related to farming and other rural livelihoods.

<http://www.mmm.fi/en/index/frontpage.html>

http://www.mmm.fi/en/index/frontpage/climate_change_energy.html

Projects:

Finland is a member of the working group of European standard for: “Guidelines for improving energy efficiency of architecturally, culturally or historically valuable buildings.” CEN/TC 346/WG 4/TG15. The Ministry of the environment represents Finland in the working groups.

Finland is a partner of the CO₂OL Bricks –project in the framework of the Baltic Sea Region Program 2007 – 2013, where 9 Baltic countries sort out how to reduce the energy consumption of historical brick buildings without destroying their cultural value and identity.

<http://www.co2olbricks.eu/>

Finnish National Board of Antiquities is a member of the monitoring group on cultural heritage of the Baltic Sea States that aims to increase the sustainable management of cultural heritage on a regional level.

<http://mg.kpd.lt/LT.html>

ARVO – is a pilot project on successful renovation practices for valuable buildings, where the energy efficiency requirements are taken into consideration in protected buildings. The Finnish National Board of Antiquities has been involved in the project.

KORMA – is a project that aims to produce models for moisture safe rehabilitation solutions for housing from 1950-1970. The ministry of environment and Technical Research Centre of Finland (VTT) are involved in the project.



BUILT WELFARE PROJECT - is an evaluation project which aims to raise awareness about the post-war built environment in Finland, and to identify its values. The project also aims to develop tools for renovation and maintenance of the buildings of this era. Finnish National Board of Antiquities (NBA) is involved in the project.

2) How have the requirements of EU's Energy Performance in Buildings Directive (EPBD) and other legislative measures been applied with regard to the architectural heritage, and what are the results - so far?

The aim in Finland is to set energy efficiency standards not only for new buildings but also for the existing building stock.

In Finland heritage buildings, which are protected by law, have been possible to exclude from the Energy Performance in Buildings Directive (EPBD). Also buildings that serve for religious purposes, buildings that are built for temporary use (max. 2 years), housing buildings that are in use maximum 4 months per year and independent buildings with a surface area of maximum 50 m² are excluded from the EPBD.

Currently the Ministry of the Environment is working on national legislation for this issue. There is a new addition on rehabilitation to the national building code. The working group also includes a member of the NBA.

The Eco Design Directive aims for eco-efficiency of machinery and equipment, however since the directive includes the old equipment in protected buildings (such as light fittings and elevators) the result is not cost-efficient and very often instead of upgrading systems to the standards of the directive the equipment is renewed.

The VAT Directive does not encourage rehabilitation but renewal.

The EPBD directive requires that public buildings become pilot projects of energy efficient improvement, i.e. the most valuable national buildings become the experimental field of energy efficiency renovation.

3) Which (urban) historic building categories are most vulnerable and what are the likely implications if, a) upgraded according to EU and/or national environmental standards, and b) Not upgraded.

The most vulnerable part of our heritage are buildings which are not protected by law, but are typical examples of their era.

Log houses are a very typical part of the Finnish landscape. These buildings need insulation in order to become more energy efficient buildings. However, their structural physics is special, and in log structures it is difficult to comply with heat insulation regulations.



Blocks of flats from the 1960s and 70s in the suburbs of Finland. This building type requires new windows, glazing balconies and external wall insulation, renovation steps that make more energy efficient flats but change the architecture completely.

Post-war detached houses (so called veteran houses) are very typical of the Finnish landscape. These buildings, which are timber framed wooden houses, are very much in need of insulation and energy renovations are mostly done by their owners. There is an acute need of renovation consultancy, so that insulation is done correctly and without changing the architectural character of the building types. Sandwich wall structures and multi-layer base floor structures of the 1970s and 80s are very challenging and expensive to renovate for energy efficiency. Buildings with attic floors have better possibilities for insulation without destroying the architectural properties of the buildings.

Buildings of the Modern Movement. Roof insulation is very expensive and difficult since they affect the original architectural detailing. At the moment improving the energy efficiency of these buildings relies on heat recovery from ventilation. This method requires airtight buildings and mechanical ventilation systems. It is not very realistic to make airtight structures in historical buildings, they cannot be sufficiently air tight for economic, aesthetic, historical and architectural reasons. The development should be based on natural energy-saving practices such as an adaptive model instead of an ASHRAE Standard 55 static model.

In Finland the National Board of Heritage has suffered serious cutbacks in 2012 and therefore the National strategy on protection of monuments is to be discussed in view of the state beginning to sell real estate in its possession. State realties have not been systematically legally protected so far since it has been considered appropriate to protect them in cooperation with the authorities, the users and the National Board of Antiquities. However in this new situation it is necessary to protect these buildings by law.

4) What are the long and short term environmental challenges facing the heritage management sector and what are the associated research needs?

Short term challenges are the energy efficient requirements in order to reduce greenhouse gas emissions which can be a threat to the preservation of the characteristics of buildings (additional insulation, replacement of windows and exterior doors, etc.)

Renewable energy use (solar, wind, wood, geothermal energy)

A support for the aims of conservation of buildings, but the characteristics of buildings should not be changed.

Saunas are generally heated by wood and especially smoked sauna buildings have a very high cultural value. The problem is small particle emissions.

Changes in the heating system should be made only if the heat distribution system remains the same. Central water-heating systems are the most common heating system in the cultural historically significant buildings in Finland. Central heating is very common in Finland, with 90% of the heating in



Helsinki. Many of the protected buildings are heated by electricity. Electrical heating is a safe way of heating the heritage buildings since there is no risk of water damage.

Long term challenges are floods, rising sea level and increased atmospheric moisture.

The problem is that in practice renovation follows the methods of new building practices (as well as the standards of building practices and materials). The history of building methods and their structural physics is not well understood, so the tendency is to renovate protected buildings by changing the old into the new.

5) What legislative, systemic, management and practical tools are used for analyzing, safeguarding and upgrading historic urban resources?

In Finland taking care of the cultural environment and architectural heritage is primarily based on town planning and building guidance i.e. the Land Use and Building Act. It is complemented by the Act on the Protection of Buildings and the Decree on the State-owned Buildings (480/85). The protection of Church buildings is provided for by the Church Act (1054/93). Fixed relics are protected under the Antiquities Act. The cultural environment is extensively also referred to in other legislation such as the evaluation of environmental effects, Nature Conservation Act, Forest Act, Water Act, road legislations and Land Extraction Act. They include statutes aimed at the protection and preservation of beauty and cultural values.

The protection of cultural heritage provided by the Land Use and Building Act is based on direct plan stipulations, and indirect means administrated by the community structure and its functions. The museum- and environmental authorities can influence the contents of the plans at the planning stage through the official statements they issue. In possible conflict situations complaints about the planners' decisions can be taken to the Administrative Court. The renewal of the Land Use and Building Act (2000) has increased the independent position of the Municipalities in making planning decisions, thus limiting state intervention to mainly general planning (regional plans) as well as the planning of waterfronts. But as a counterpoint to this, the Act has also made the requirements more specific, for instance in regard to taking the cultural environment into account in planning.

http://www.nba.fi/en/cultural_environment/built_heritage/protection_system

Building Heritage register (National Board of Antiquities) and the inventories about the building heritage (national, regional and local inventories), the National Building Heritage Strategy, regional Cultural Environment programmes, the national and local architectural policies are the resources for analysing safeguarding and upgrading the urban heritage.



6) Who are the target groups (for the project and results)?

Building inspection offices of municipalities, National board of Antiquities, building owners and professionals working with the conservation of architecturally, culturally or historically valuable buildings.

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Latvia

1. In what way is the heritage sector involved in developing and promoting good practice (urban) conservation principles, regarding sustainable use and reuse of historic buildings and cultural environments in reference to the national heritage management system?

The State Inspection for heritage protection (VKPAI) is involved in the approval of legislation. It also prepares projects for legislation, as well as providing advice on projects prepared by other institutions.

In the summer of 2011 the Ministry of Economics submitted to the Cabinet of Ministers of the Republic of Latvia a proposal to change the Normative acts, to simplify the process of replacing windows when no other facade changes are made. The proposal involved changing the General building regulations, the Regulatory acts of the State Inspection for heritage protection, as well as the Building Regulations for the Riga Historical centre and its protection zone. The original reason for the proposal was to increase the heat insulation by promoting the replacement of old windows. It also proposed removing all limitations to the replacement of windows in historic buildings, except the listed buildings of National importance. VKPAI objected to the proposal, anticipating a considerable threat to the cultural - historical value of the buildings that form the historic development, as well as to the aesthetic quality of the environment in general. After comprehensive discussions the result was to accept alterations in the regulations allowing a simplified procedure for the replacement of windows outside the protected zones. Regarding the replacement of windows within the protected zones strict requirements are in place, which promote the restoration of the historic windows, or if restoration is not possible, the production of identical copies. The specialist building engineer, employed by the VKPAI, is involved in the development of the Directives of the European Parliament and of the Council on energy end-use efficiency 2004/8/EK un 2006/32/EK.

2) How have the requirements of EU's Energy Performance in Buildings Directive (EPBD) and other legislative measures been applied with regard to the architectural heritage, and what are the results - so far?

The Law on the Energy Performance of Buildings (adopted originally in 13.03.2008) includes legislative regulations based on the Directive 2002/91/EK. The law is not mandatory for buildings (1) which are cultural monuments or in which cultural monuments are located, if the Law endangers the preservation of cultural monuments or reduces their cultural and historical value; (2) which are used



for religious services or other religious activities; (3) in which a heating system is not intended or is not installed; or (4) the total heating area of which is less than 50 m² (Section 3). The results have not been evaluated yet.

3) Which (urban) historic building categories are most vulnerable and what are the likely implications if, a) upgraded according to EU and/or national environmental standards, and b) Not upgraded.

The current regulations do not determine the exact level of energy efficiency for historic buildings. In general any historic, and especially culturally - historically valuable buildings within the historic centres are under threat, as they do not comply with the standards defined by the existing building regulations. The threat is even greater from added insulation, especially for wooden buildings, buildings with rich external decoration and churches. But if energy efficiency within the historic centres is totally eliminated, the cultural-historically invaluable buildings that are not in a good technical condition will suffer. In this case some measures can improve them and their operation. The greatest threat is the lack of understanding among professionals and society in general. It is impossible to have 100% energy efficiency within historic buildings.

4) What are the long and short term environmental challenges facing the heritage management sector and what are the associated research needs?

Besides the positive aspects of the long term impacts such as reducing CO₂ emissions, eliminating un-renewable resources, economic benefits, increased functionality by implementing measures, refurbishment guaranties the practical use of historic buildings.

But there are negative impacts as well. If work is done badly, there can be irreversible damage, as well as bad quality changes to the cultural-historic landscape.

5) What legislative, systemic, management and practical tools are used for analyzing, safeguarding and upgrading historic urban resources?

The Regulatory acts of the State Inspection for Heritage protection define the requirements for the alterations of the historic buildings within protected zones. Alteration projects, including increased energy efficiency, are evaluated by VKPAI. Each project is evaluated individually, taking into account the impact of proposed work on the historic development in question, as well as the historic development in general. As an example of good practice the activities of Kuldīga municipality can be described.

The municipalities can have a substantial role in promoting the qualitative maintenance of historic buildings by reducing the real estate tax of the historic buildings within their area, which have been maintained according to restoration standards. E.g. Riga municipality offers 25% real estate tax



reduction to owners of buildings forming the historic development, which are maintained according to the regulations defined by the Regulatory acts and the respective institutions. This strategy becomes more attractive as real estate tax increases.

Since May 2011 financing from the EU is also available to multi-apartment buildings constructed before 1940. Therefore VKPAI has to assess the projects for increased energy efficiency (insulation of buildings) within protected zones, to avoid threats to the cultural - historic value, while trying to find solutions that increase energy efficiency.

6) Who are the target groups (for the project and results)?

No answer.

References and literature

Regarding the legal acts, the State inspection for Heritage protection has prepared the recommendations for the increasing of the energy efficiency of the historic building:

http://www.mantojums.lv/?cat=848&lang=lv&fulltext_id=6665





Norway

1. In what way is the heritage sector involved in developing and promoting good practice (urban) conservation principles, regarding sustainable use and reuse of historic buildings and cultural environments in reference to the national heritage management system?

At the national level Riksantikvaren (The Directorate for Cultural Heritage) is responsible for the practical implementation of the Norwegian Cultural Heritage Act and the objectives laid down by the Norwegian Parliament (Stortinget) and the Ministry of the Environment. The Directorate's task is to facilitate sound and efficient heritage management throughout the country.

The regional level for public management of the Cultural heritage is by delegated authority from the Directorate of Cultural Heritage, and has as its main task the management of protected cultural heritage of national value in the county. The county council shall, as far as possible, give the municipalities help and guidance in planning and development issues under the Planning and Building Act.

The Municipality is the key authority when it comes to the Planning and Building act – zoning plans (protection) and building permits. Some larger cities have Cultural Heritage Management Offices which advise on all questions of conservation and cultural heritage.

All levels give advice to owners on topics like maintenance, changing of valuable buildings, energy efficiency etc.

Buildings that are protected by the Cultural heritage law are not a big challenge, there are not many, and Riksantikvaren has the authority to decide whether a measure may be accepted. RA accepts some energy efficiency measures, but protection of the cultural heritages value is of primary importance.

The big challenge is all the buildings that are not protected through the Cultural Heritage Law. They may be protected by zoning plans, or listed by the local municipality, but many are not. There are many important buildings with cultural heritage values that give character to historical urban areas, approximately 300-400 000 buildings. The Planning and Building law allows exceptions from energy efficiency demands when the measures are not consistent with the preservation of cultural values. In these cases requirements can be met as far as is possible. This exception applies to objects listed through the Cultural Heritage act, the Planning and Building act and objects with similar value.



It is important to implement energy efficiency measures – but at the same time there is a danger that this may cause major damage to their cultural value. Riksantikvaren gives advice to local authorities concerning the legal requirements related to energy requirements for old houses, lifecycle aspects, more grants etc.

Projects:

Norway is head of the working group developing a CEN European standard for: “Guidelines for improving energy efficiency of architecturally, culturally or historically valuable buildings.” The standard will provide guidelines for improving the energy efficiency of architecturally, culturally or historically valuable buildings, while preserving their inherent cultural heritage values. This also includes normative working procedures for assessment of possible CO₂ emission savings, and measures of energy efficiency for these buildings, taking into account consequences and risks. Generally the guidelines will be applicable to a wide range of existing buildings where special consideration is needed in order to find a sustainable compromise between energy conservation and building conservation.

Framtidens byer - Cities of the Future - is a collaboration between the Government and the 13 largest cities in Norway to reduce greenhouse gas emissions and make the cities better places to live. The goal is to develop compact and good cities regarding land use and transport, consumption and waste, energy and buildings, and climate change. Cultural heritage is a topic in this program, but so far very few project is related to this topic.

<http://www.regjeringen.no/nb/sub/framtidensbyer/forside.html?id=551422>

Pilot projects, such as Arilds gate 6, a brick building from 1906 that is being improved for accessibility, energy saving, fire protection etc. There is a need to have good examples and learn from practical projects, to promote energy saving and the caretaking of old houses. This building in Trondheim is part of Cities of the Future. All municipalities in Norway are supposed to make an energy and climate action plan, but cultural heritage is rarely a topic.

Riksantikvaren has initiated studies on:

- How energy efficient can old windows be when being improved with new interior window frames
- "What advice is good advice?" connected to energy saving.
- Comparison of greenhouse gas emissions for an upgraded old log house and a new low-energy house throughout the life cycle of the buildings.

Statsbygg- (The Norwegian government's key advisor in construction and property affairs, building commission, property management and property development) has developed a Climate Gas Accounting database which makes it possible to calculate the green house gas emissions from existing and new buildings. This calculation tool makes it possible to calculate greenhouse gas emissions throughout a building's life cycle, its carbon footprint, and shows the changes in emissions between different chosen solutions. This tool helps in making the right choices for minimizing the climate impact of buildings.



The Ministry of the Environment has in cooperation with Riksantikvaren initiated a study on how many old buildings in different categories there are, and what the energy saving potential is if we take into account the cultural and historical values, and if we do not. The report shows that even though this means marginally lower energy savings, it has little impact in a national context.

Riksantikvaren produces information material for all levels.

Use and reuse

There are mainly cultural heritage authorities on the regional level that are in contact with projects, such as large harbour and industrial areas that have been changed during the last 20 years.

At the moment there is a huge and exclusive focus on energy consumption in the use phase. The Planning and Building Act will become stricter – also for existing buildings. A special regulation (forskrift) for existing buildings linked to the Planning and Building Act will probably be made.

The trends are that old buildings should be like new buildings – with little care and understanding of historical values; there is hardly any focus on life cycle aspects; there is hardly any use of experience from existing buildings in modern buildings, which are more and more technically advanced. Many people have a lot of money, and use it on their houses – making them more modern, with new kitchens etc. There is a strong focus on energy efficiency within the construction industry - but less among ordinary people. Energy is cheap in Norway, so there are examples of even well-insulated houses using more energy because people want higher indoor temperatures.

Requirements in building legislation can be difficult to comply with, and can cause physical damage to buildings and the loss of cultural and historical values. But it is also important that old houses have improved energy efficiency, are good to live in, have acceptable energy bills and are popular to use.

Godt nok! = "Good enough!" - is a guide to technical requirements in the building legislation for existing homes – a cooperation with the “National authority of Building technology and administration” (currently uncertain as to whether it will be continued)

Despite a considerable amount of work, Riksantikvaren needs to be working on more pilot projects and studies; work more on communication; and be able to give more exact advice etc.

2) How have the requirements of EU’s Energy Performance in Buildings Directive (EPBD) and other legislative measures been applied with regard to the architectural heritage, and what are the results - so far?

The EPBD is not yet implemented in Norway, but will be soon. However most of the requirements have been introduced. In the Planning and Building Act there are requirements for U-values, energy demand and energy source. Existing buildings have to meet the requirements when going through a major renovation. For smaller measures, the measure in itself must meet the requirements. The possibilities for exceptions are not well defined and practice varies from case to case. There are



slightly lower requirements for log buildings. The Planning and Building Act allows exceptions from energy efficiency demands for historically valuable buildings as in the EPBD.

The possibility to exempt listed buildings and cultural buildings in the EPBD is followed up in the Planning and Building Act in the requirements for existing buildings. The system of energy labels has been introduced. It is a challenge that the system does not take historic construction methods into account, advice on measures on energy efficiency given are of poor quality, and can cause physical damage to the building and a loss of historical and architectural values. There is a danger that old buildings will become unpopular due to higher running costs. There is a need for life cycle assessment thinking.

Energy certificates have been introduced: There are possibilities for exemptions from energy certification for old buildings used for worship and other religious buildings, listed buildings and museum buildings and other buildings of historical and architectural value when they cannot be improved without destroying important characteristics.

Based on the EPBD the goal is to create increased awareness on conserving energy. It is required for buildings for sale or lease, commercial buildings and for new buildings. The tool for making an energy certificate is not adapted to traditional building technology.

The labeling system is as follows:

- Energy grade from A to G based on estimated energy requirements. How well is your house insulated? - C is the required level today, B = low energy, A = passive house level.
- Heating grade - COLOUR - How environmentally friendly is the energy you use? Heating grade determined by the proportion of the total heating requirements covered by electricity and / or fossil fuel products, which must be below certain values to achieve the different colour grades.

Our conclusion is that there is a danger that old houses may become unpopular, “hopeless to improve”, and that the advice given is damaging to existing buildings. Our objectives are that Lifecycle thinking LCA needs to be introduced, and that old building structures must be included.

Available advice must be improved as this is an opportunity to create and give better advice. With more accurate knowledge old buildings will improve and have more accurate ratings, there will be a higher awareness of how old building's perform, and an increased focus on renewable energy.

3) Which (urban) historic building categories are most vulnerable and what are the likely implications if, a) upgraded according to EU and/or national environmental standards, and b) Not upgraded.

Brick buildings with wooden structures are vulnerable because the buildings are very sensitive to moisture. Where wood and bricks are used together, they are prone to fungus, dry rot and frost damage. Where there are "warm" walls - the heat loss helps to keep the walls warm and dry, but they have poor insulation properties. There is a great danger of physical building damage if measures



are not well thought out. With internal insulation the walls are colder and drying out will take longer, with possible rot and frost damage. With external insulation the building's appearance is changed.

For wooden buildings increased insulation and changing windows can change their appearance. In apartment and office buildings from after 1945 we see some examples of extensive conversions to low energy and passive house standard, which totally change their appearance.

Our conclusion is that there are many vulnerable categories. Brick buildings with wooden structures are most vulnerable, and at risk due to poorly qualified advice and practices.

If upgraded according to EU and/or national environmental standards there is a great danger of physically damaging- and changing the appearance of buildings. If buildings are not upgraded they risk becoming unpopular and being seen as a threat to the environment.

4) What are the long and short term environmental challenges facing the heritage management sector and what are the associated research needs?

Challenges are:

- Climate change, with a wetter and wilder climate
- The changing of requirements due to climate change
- Reducing energy consumption - because of the environmental impact of energy production, and the need to use electricity for other purposes than space heating
- The lack of a holistic life cycle perspective. There is almost only focus on energy consumption in the initial phase, none on climate gas emissions from the production of materials
- A lack of focus on embodied energy/resources in old buildings which are often replaced by new energy efficient buildings without calculating the total life cycle emissions
- The loss of traditional knowledge
- The lack of maintenance of older buildings
- The alteration of existing buildings and properties
- Modern building technology and design without the use of traditional knowledge

There is a focus on the mitigation of climate change, and a danger of side tracking heritage interests. We need to establish common development objectives with climate change mitigation.

Identified research needs:

- More traditional knowledge – we need to know more about how old buildings function and how to use this knowledge also in modern construction.
- Life Cycle analysis LCA and greenhouse gas accounting for old buildings to see how they really perform.
- More knowledge about how old houses / structures / materials work, what are the real U-values, how should we proceed to implement energy efficiency measures; obstacles and



opportunities – how do we meet our target which is to have well kept energy efficient old buildings with their cultural values intact.

- Pilot-projects that show how to solve the challenges.

5) What legislative, systemic, management and practical tools are used for analyzing, safeguarding and upgrading historic urban resources?

Laws, standards, tools and so on all focus on single buildings and on energy consumption in the running phase. Very little is done specially on urban buildings or areas.

There are approx. 5000 buildings listed through the Cultural Heritage act. In addition we have approx. 5000 buildings in museums and 1000 churches listed. We have no figures for how many buildings are listed through the Planning and Building act, but there are several thousand. Owners, consultants and municipalities have a varying amount of expertise.

Our measures to improve the planning and construction process and the final results are:

- Analysis: Condition assessment, Energy calculation Standards, Greenhouse gas accounting
- Safeguarding/Legislative measures: Planning and building act, Cultural heritage act, Guidelines
- Upgrading: Grants, Standard description texts on measures.

6) Who are the target groups (for the project and results)?

Property managers/owners, professionals involved in the cultural heritage sector at a national and regional level, **local authorities (municipalities, provinces), architects**, energy auditors and energy experts.

References and literature

http://www.riksantikvaren.no/Norsk/Tema/Energi_og_miljo/
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http://www.regjeringen.no/nb/dep/md/dok/lover_regler/retningslinjer/2009/planretningslinje-klima-energi.html



Sweden

1. In what way is the heritage sector involved in developing and promoting good practice (urban) conservation principles, regarding sustainable use and reuse of historic buildings and cultural environments in reference to the national heritage management system?

The heritage management system is involved in several projects, programs and delegations. There are some governmental decisions that affect the heritage sector, but since the heritage sector is under the Ministry of Culture, and sustainable development issues are often introduced by the Ministry of the Environment, the Ministry of Enterprise, Energy and Communications or the Ministry of Health and Social Affairs their participation is often “forgotten” or delayed. However the coordination and interaction between responsible bodies like the heritage board, the property board, the board of housing and planning, the environmental agency, energy agency etc. could be enlarged as the support to - and coordination with - the administrative bodies on regional and local levels.

Examples of involvement:

The Delegation for Sustainable Cities (urban level) – a national arena for sustainable urban development - has been tasked by the Swedish Government with handling and deciding on financial support for the development of sustainable cities. Initially for 2008-2010 it is now prolonged until 2012. The government has also assigned “Hållbar stadsutveckling” (Sustainable urban development) to four governmental agencies (The National Heritage Board, the Museum of Architecture, the Board of Housing and Planning and Formas) to work together to promote sustainable urban development. Their work was scheduled to end in 2011, but the cooperation continues. A national seminar is planned in November 2012 with the Delegation for Sustainable cities, who are going to hand over their responsibility to a governmental agency (yet to be formalized). The heritage sector represented by The Swedish National Heritage Board (RAÄ) is an interactive partner in the delegation.

<http://www.hallbarastader.gov.se/bazment/hallbarastader/sv/start.aspx>

Projects which are aiming at the existing urban level and have got financial support from The Delegation;

- City of Umeå. Ålidhem the sustainable cultural district (2009), including an evaluation.
- City of Örebro. 1. Regeneration of modernist city district (2010). 2. Historic communication area. 3. A bicycle town for everyone.
- Municipality of Mölndal. Climate smart life style in a historic factory district (2010).
- City of Stockholm. From gallery housing to green social living (2010).



- Botkyrka municipality. Renewal of Alby modernist housing area (2011).
- Royal Institute of Art. Urban futures (2011).
- WSP Ltd. Meeting spot for sustainable urban development (2011).
- Municipality of Ulricehamn. Strategy for a living city (2011).

Short listed for support 2012:

- Berg/CF Möller Architects. A heritage in transformation.
- Järfälla municipality. Sustainable interface between town and countryside.
- City of Kalmar. South city district.
- City of Luleå. Sustainable district.
- City of Lund. Walkable city.
- City of Jönköping. Planning support for sustainable towns and villages.
- University of Malmö. Green game for transformation.
- Motala municipality. Bicycle town.
- Riksbyggen. Modernist district Holma.
- City of Ronneby. Sustainable district.
- City of Södertälje. Ronna, the sustainable modernist district.
- City of Umeå. Sustainable cities in the Nordic countries.
- Virserum art hall. Triennial for sustainable planning.
- City of Ängelholm. Certification of small urban districts.
- City of Örebro. Analysis of social sustainability in urban planning projects.

The generational goal (urban level) – the overall goal of Swedish environmental policy – defines the direction of the changes in society that need to occur within one generation if the country's environmental quality objectives are to be achieved. Sixteen environmental quality objectives describe the state of the Swedish environment, and what environmental action is needed. These objectives are to be met within one generation, i.e. by 2020 (2050 in the case of the climate objective). RAÄ is involved in surveying and creating indicators on the state of the cultural heritage environment; and in supporting county and municipal administrative bodies within the heritage management system as well as other organizations and agencies. RAÄ is proactive in influencing the environmental quality objectives: goal 15. A Good Built Environment - Cities, towns and other built-up areas must provide a good, healthy, living environment and contribute to a good regional and global environment. Natural and cultural assets are to be protected and developed. Buildings and amenities are to be located and designed in accordance with sound environmental principles, and in such a way as to promote the sustainable management of land, water and other resources. This objective is intended to be achieved within one generation.

<http://www.miljomal.se/Environmental-Objectives-Portal/>

There is a governmental project that was initiated in 2009, where 5 governmental agencies cooperate on Sustainable urban development. In 2010 they supported 6 different projects, with 3 million Euros, on how urban sustainable development can help to reduce social and economical differences and help integrate people. The work resulted in a research report in 2010 which can be found here together with some English publications (urban news and when people matter).



http://www.raa.se/cms/extern/aktuellt/regeringsuppdrag/hallbar_stadsutveckling.html

RAÄ has, with other organizations, worked on how to be prepared for saving objects and heritage in case of disaster (building and urban level). It has resulted in a web based handbook:

<http://www.raa.se/publicerat/9789172095199.pdf>

Energy Efficiency in Historic Buildings (henceforth "Spara och Bevara" - "Save and Protect") (building level) is a research and development program to promote energy efficiency in historic buildings. The aim of the program is to develop and disseminate knowledge and technical solutions that will contribute to energy efficiency while safeguarding the cultural heritage, a collaboration between the University of Gotland, the Energy agency and RAÄ.

<http://www.sparaochbevara.se/english.php>

The National Property Board, Sweden (building level), is responsible for the palaces, royal parks, embassies, wild nature and many historical buildings in Sweden. They strive to protect and preserve the heritage in the best possible way, with the main aim of making the heritage accessible.

<http://www.sfv.se/cms/sfv/english/english.html>

"CO₂OLBricks – Climate Change, Cultural Heritage and Energy Efficient Monuments" (building level) is a project in the framework of the Baltic Sea Region Program 2007 – 2013. The project has 18 partners from nine countries. One of the main objectives is to develop new methods for implementing the energy efficient refurbishment of historic brick buildings, without destroying their cultural value. Until the end of 2013, "CO₂OLBricks" will collect results in the work packages "Policy Development" (WP3), "Technical Innovations" (WP4) and "Education and Economic Promotion" (WP5). The project aims to form a transnational common position concerning the energy efficiency of historic buildings; to find new technical solutions for refurbishment; and to improve the competence of craftsmen, architects and engineers. Administrative Partner is the Department for Heritage Preservation at the Ministry of Culture in Hamburg. The Swedish National Heritage Board is responsible for WP 3. SuHiTo is an Associated Partner of the project, taking part in its development, the exchange of information and network cooperation. Further information is accessible on the projects website:

<http://www.co2olbricks.eu/>

The National Heritage Board and the University of Gotland are involved in developing standards, CEN task group 15, Energy efficiency in protected buildings (building level).

2) How have the requirements of EU's Energy Performance in Buildings Directive (EPBD) and other legislative measures been applied with regard to the architectural heritage, and what are the results - so far?



In Sweden historical buildings such as listed buildings, churches, places of worship and buildings protected in a municipal development plan are excluded from the law of energy audits SFS 2006:985 (based on the Directive 2002/91/EC of the European parliament and the council on the energy performance of buildings). Additionally the regulations stipulate that any building with cultural heritage value cannot be changed in a way that reduces the value. Building regulations are supposed to protect the entire built heritage in order to avoid removal of features that contribute to the character of a building.

Depending on how different municipalities work with local municipal development, plans and regulations, there is a difference in the protection of buildings that are not listed. The municipality is responsible for deciding if a building is excluded or not from the demands of energy audits. It can be alright to do an audit declaration as long as the proposals do not change the character of the building or destroy cultural values. The energy audits have to be done by a certified auditor, and there are three grades of certificate for different buildings and systems. The certified auditors qualified to work with complex buildings, are supposed to know how the different energy saving solutions might affect the cultural and architectural values of a building, but unfortunately the majority are not qualified to make such decisions.

Regarding churches there have been a lot of changes in heating systems that have not always been successful. There is a lack of written support for making decisions, and a lack of knowledge at the administrative county boards. Also there is a lack of qualified expertise in the municipal building offices. They do not always have sufficient knowledge or a system/method to decide if a building might have cultural value, and require building conservation qualifications according to the law. This is one of the reasons why there are problems with changed windows and facades.

There is a general lack of knowledge regarding energy efficiency in historic buildings, which leads to damage and negative effects on cultural heritage buildings. The question is if it is good or bad that historical buildings such as listed buildings, churches, places of worship and buildings protected in a municipal development plan are excluded from the law of energy audits (EPBD)? Is it because we do not know how to deal with them? It is good as long as there is qualified expertise, and auditors that have the qualifications to make the right energy saving proposals for a historical house. The bad side is that if we do not do anything with these buildings, we won't save energy, people may not be able to afford to live in them, and they will no longer be maintained. If we could use the audits to actually preserve historical buildings, the law could be changed with stricter requirements for the competence of the auditors, so that proposals should be done with a building conservator or qualified professionals. The system for energy audits could maybe be changed and be of better use.

3) Which (urban) historic building categories are most vulnerable and what are the likely implications if, a) upgraded according to EU and/or national environmental standards, and b) Not upgraded.

Most vulnerable is the heritage which is only protected by The Environmental Code and the Planning and Building Act monitored by the municipalities. There is no national register of this heritage, it is difficult to control and a buildings fate is decided from case to case. Especially rural municipalities



have a problem finding qualified employees to decide in heritage issues. Next on the scale of vulnerability are listed buildings owned by private people if they are not advised correctly.

a) If upgraded correctly the heritage can continue to be inhabited and the life cycle of the heritage is prolonged. Because of many funds and tax reductions with a short time schedule the risk of failure increases.

b) If not upgraded because of the energy and/or refurbishment costs the heritage might be abandoned partly or totally.

4) What are the long and short term environmental challenges facing the heritage management sector and what are the associated research needs?

Energy cost is the biggest short term challenge because it can force people to abandon buildings or not refurbish them. CO₂ emissions from buildings are considerable (ca 30% in Sweden) causing long term challenges like climate change. Climate change causes erosion, increased sea levels, storms and heavy rainfall, corrosion caused by chloride in the soil etc. which can cause damage on heritage buildings, objects and environments. We need qualified expertise and knowledge on how to give good advice on energy and environmental questions. We need more information and research about how big the problem is, how energy efficient an old construction is compared to a new one, and the need for analyzing a building during its whole life (LCA). We also need more research about the heritage itself and following up and documentation after refurbishment is done since there is no coordination nationally on the non-listed heritage. There is a need for documentation on listed buildings as well.

5) What legislative, systemic, management and practical tools are used for analyzing, safeguarding and upgrading historic urban resources?

In Sweden it is the Swedish National Heritage Board (RAÄ) that gives permission to change listed buildings that are state owned, and describes how this shall be done. If changes are allowed the work has to be monitored and supervised by qualified building conservators. Architects for state owned heritage may be selected by the National Property Board (SFV), who is responsible for preservation, in collaboration with RAÄ.

For permission to change private listed buildings the decision is made by the county administrative board, decisions can be appealed to RAÄ.

Professional building owners like the National Property Board (SFV) may select their own architects and qualified building conservators for heritage protected by the Plan and Building act. Their knowledge and experience guarantees a model achievement.



The county board approves building conservation competence authorized by Boverket. According to the Plan and Building Act the municipal building offices decide if a building might have cultural value, and when they should demand a qualified building conservator.

RAÄ keeps a national register of churches and listed buildings called "Bebyggelseregistret". Counties use "Källa" a computer system for following up funding given to listed heritage buildings. There are different methods among municipalities on how to document, and identify heritage:

6) Who are the target groups (for the project and results)?

Property managers, professionals involved in the cultural heritage sector at a national and regional level, energy auditors and energy experts.

References and literature

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Back cover photograph

Tartu has many beautiful wooden buildings with ornaments and entrances of high architectural and historical value. The need for maintenance, repair and energy saving is tremendous, but there is always a danger that renovation and energy efficiency measures can lead to building damage and loss of historical qualities. Measures should always be thoroughly evaluated to avoid problems. Energy saving measures at block or district level should be considered in historically and aesthetically vulnerable areas. Photo: Marte Boro©Riksantikvaren



