Approaching Near Zero Energy In Historic Buildings

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Deliverable Title: Report on existing online tools for energy-related renovations of historic buildings

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Deliverable Type: R
R = Document, report
DEM = Demonstrator, pilot, prototype, plan designs
DEC = Websites, patent filing, press & media actions, videos, etc.

Dissemination Level: PU
PU = Public
CO = Confidential, only for members of the consortium, including the Commission Services

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Summary

The objective of this activity is to map free online tools on energy efficient renovation which are used in EP partner regions. Information on on-line tools for retrofitting that are to historical buildings used in partner countries was gathered from project partners. All the partner regions have more than one online tool that deals with energy use in buildings. Faroe Islands does not have any local online tools and they use mostly Danish or Norwegian tools.

Majority of websites identified provide information, guidance and checklist for energy efficiency improvement. Free online tools/software that provide energy saving calculations are relatively less in partner regions. Nevertheless, such tools are available, for example, energy savings calculation tool by Sustainable Energy Authority of Ireland (https://www.seai.ie/tools/), Finland (www.laskentapalvelut.fi), Scotland (https://www.homeenergyscotland.org) and in Sweden (www.rockwool.se). Free online tools that help to calculate the cost of renovation is available in Finland https://www.suomirakentaa.fi/, Ireland (RetroKit), Sweden (Totalverktyg by www.belok.se)

The mapping of websites were able to identify only a few website that are specific to historical/heritage buildings: STBA Retrofit Guidance Wheel (http://responsible-retrofit.org/wheel/ in UK, https://www.museovirasto.fi/ and in Finland. The Historic building energy retrofit Atlas https://www.hiberatlas.com/en/welcome-1.html provides case studies on renovation of historical buildings in Europe.

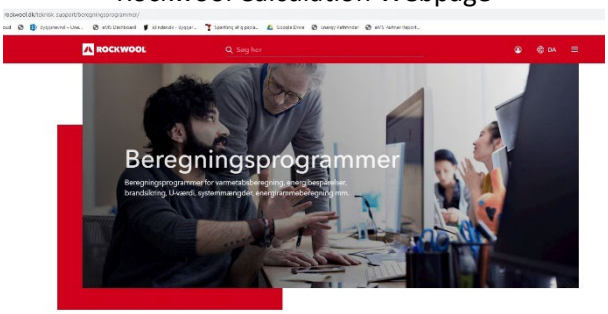
In addition, there are a few other online tools which are developed as part of either EU project or funded by individual member countries. A brief information of a few such computer-based tools for facilitating energy efficient retrofits in historical building is provided in this report (refer Others section). Further, there exists several commercial software for energy saving calculations and dynamic energy simulation tools such as IDA ICE which is common in Sweden, VIP Energy, Energy Plus and Transys and building life cycle assessment tools such as One Click LCA, SimaPro.

1. Faroe Islands/Denmark

1.1

The Rockwool homepage (Danish) has a number of free programs for calculation of Energy-use, Savings during Insulation of roofs, U-value calculation on roofs.
https://www.rockwool.dk/teknisk-support/beregningsprogrammer/

Rockwool Calculation Webpage

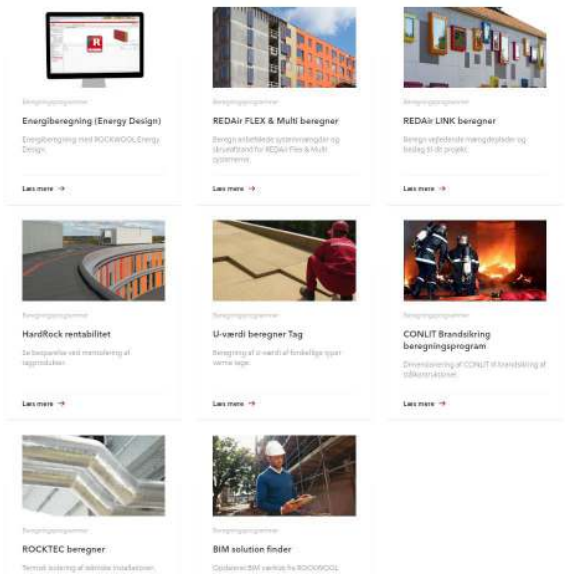


Beregningsprogrammer

1.1.1 Topics covered:

Energy Use
Savings by Insulation on Roofs
U-Value Calculation

Different programs

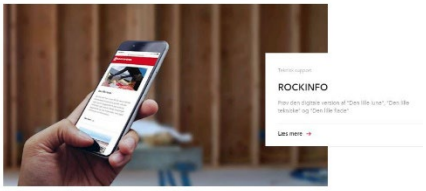


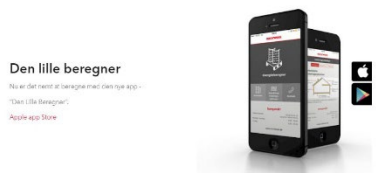
1.1.2 Contents:

You need to have Adobe Flash player installed to use the programs.
The programs are easy to use and content user manuals.

1.1.3 Tools:

Calculator as an App





1.1.4 Target groups:

Energy use in new buildings and in major renovation programs.
The web-page is not for historical/protected buildings/cultural buildings as a target group.

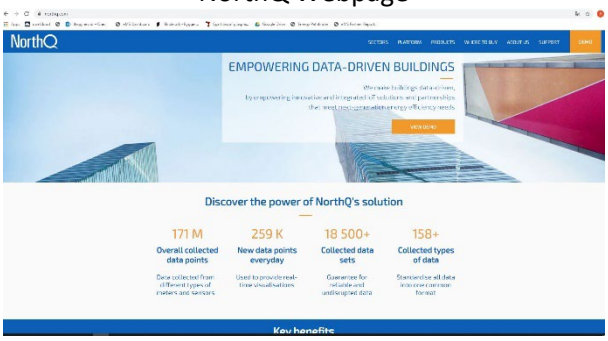
1.1.5 Business Model:

The programs are free when you calculate with Rockwool products.

1.2

NorthQ
https://www.northq.com/

NorthQ Webpage



1.2.1 Topics covered:

Data Monitoring in walls.

1.2.2 Contents:

Online tool for monitoring moisture and temperature in walls.
The programs are easy to use and content user manuals.
The Demo is free.

1.2.3 Tools:

Wireless sensors built into the walls are needed, as well as a Cloud connection.

1.2.4 Target groups:

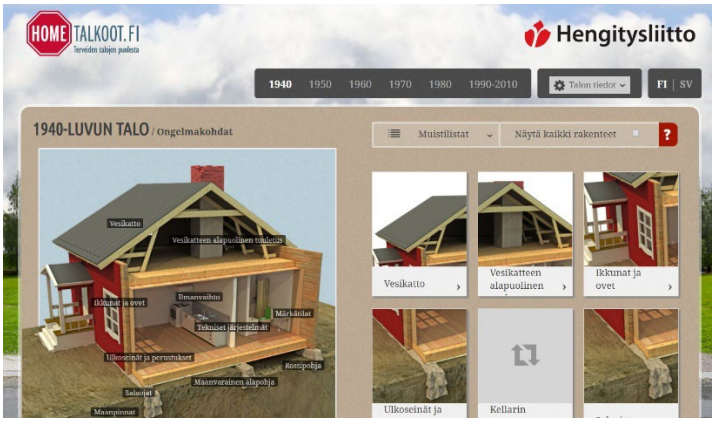
Energy use in new buildings and in major renovation programs.
The web-page is not for historical/protected buildings/cultural buildings as a target group.

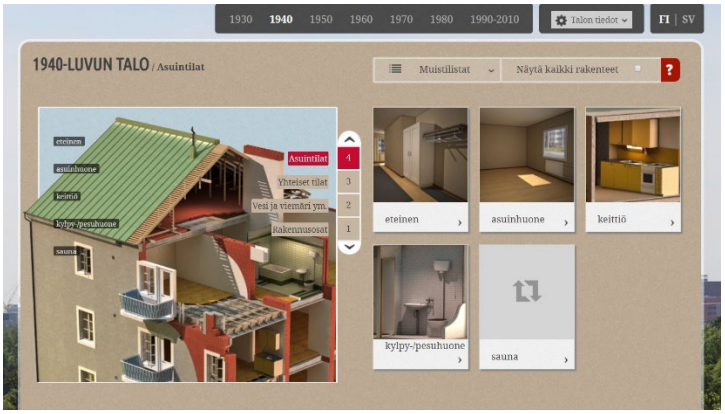
1.2.5 Business Model:

The programs are not free.

2. Finland

2.1 Hometalkoot





https://www.hometalkoot.fi/

Originally made by Ministry of the Environment, now maintained by The Organisation for Respiratory Health in Finland.

2.1.1 Topics covered:

Website offers comprehensive and practical information on house (small houses and multi-storey residential dwellings) maintenance and risk structures, as well as on the prevention of moisture and mold damage. The aim is to support property and residential owners and those responsible for building maintenance through information.

2.1.2 Contents:

Risky structures in different houses of different age. How to find and prevent problems. How to maintain and use buildings in proper manner. (Only in Finnish and Swedish languages)

2.1.3 Tools:

Checking lists, info-videos, different guides (eg. Guide for small house buyer). In original national Hometalkoot-project there was also dozens of studies and theses made by and for professionals, but they are now almost impossible to find on the web.

2.1.4 Target groups:

Owners and users of different kind of residential buildings. Website is also quite commonly used as learning material for students and professionals.

2.1.5 Business Model:

Free

2.2 Korjaustieto.fi

www.korjaustieto.fi

Korjaustieto.fi is a free online service by the Ministry of Environment Finland. It is focusing the renovation instructions.

(Notice that the main website of Ministry of Environment Finland is www.ympäristö.fi where you can find everything including the construction instructions and law regulations of Finland.)

2.2.1 Topics covered: Renovation of buildings (**not** specific to historic buildings)

2.2.2 Contents: There are only texts and links to different websites providing repair and housing advice, energy advice and database of old building materials.

2.2.3 Tools: No tools available but links to other websites.

2.2.4 Target groups: Korjaustieto.fi's target group includes residents, owners and housing companies as well as professional real estate maintenance companies.

2.2.5 Business Model:

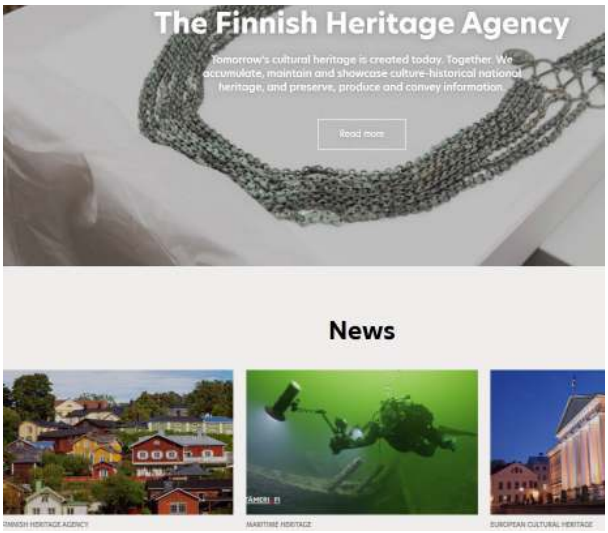
Korjaustieto.fi is a free online service

2.3 Museovirasto

https://www.museovirasto.fi/

https://www.museovirasto.fi/en/

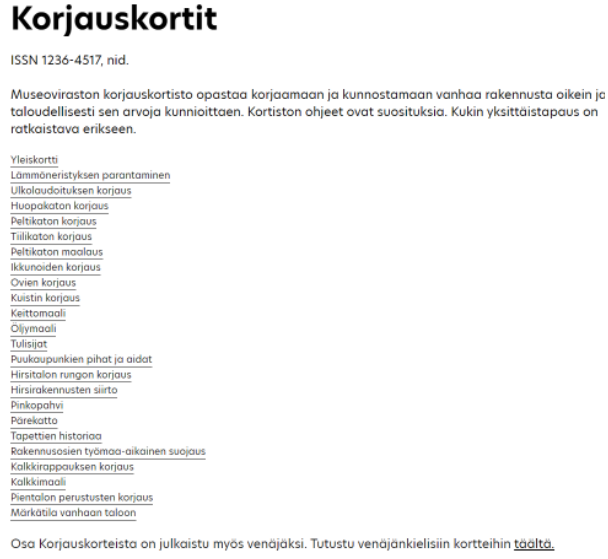
The Finnish Heritage Agency operates under the Ministry of Education and Culture.



2.3.1 Topics covered:

The Finnish Heritage Agency is responsible, together with other authorities and the museum field, for protecting environments with cultural history value, archaeological culture heritage and architectural heritage, and other cultural property

2.3.2 Contents: Instructional cards (Korjauskortit) for renovating different parts of an old building (Only in Finnish and Russian languages)
https://www.museovirasto.fi/fi/palvelut-ja-ohjeet/julkaisut/korjauskortit



2.3.3 Tools:

Instructional cards for renovating in PDF-format. (See the picture).

2.3.4 Target groups: The Finnish Heritage Agency provides varied and constantly developing services for all citizens.
There are instructors for the owners of older buildings how to renovate old buildings.

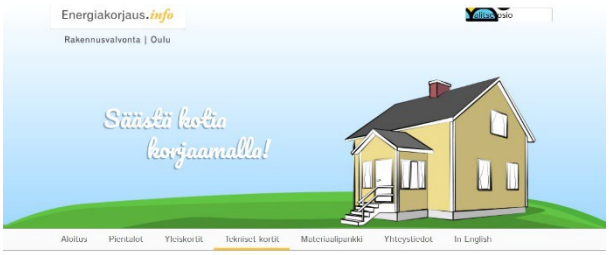
2.3.5 Business Model:

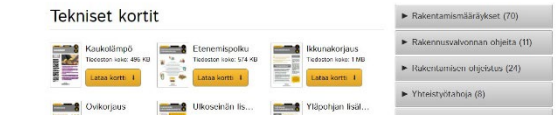
Free

2.4 Energiakorjaus

www.energiakorjaus.info

Energiakorjaus (Energy renovation) is developed by Oulu Building Supervision Office in cooperation with Ministry of the Environment.





2.4.1 Topics covered:

How to carry out normal repair measures same time taking into account energy efficiency in small houses and also in multi-storey residential buildings.

2.4.2 Contents:

Site gives information about energy renovations process models and good practices in renovating different structures, heating sources and heat distribution, ventilation and automation systems. Information is given mainly in short info cards (2-16 pages). Used to be only place you could find old Finnish technical building codes (from 1970's).

2.4.3 Tools:

Info cards serve as tools to provide multi-level information on how energy renovations would be justified in the context of other repairs.

2.4.4 Target groups: The target groups are owners of detached houses and apartment buildings, members of the boards of housing companies, property managers and construction professionals.

2.4.5 Business Model:

Free

2.5 Laskentapalvelut.fi

www.laskentapalvelut.fi

Energy calculation service provided by D.O.F. tech Oy and Saint-Gobain Finland Oy. Laskentapalvelut.fi consists of various accounting applications in the construction industry, which aim to facilitate the interpretation and use of building regulations and instructions.

2.5.1 Topics covered: Quick and easy way to create calculations or, for example, estimate material consumption. ***(Lecture videos are done by Eksergia.fi https://vimeo.com/398583110.)***

2.5.2 Contents: Energy calculating tools for energy experts for example calculation of Energy Performance Certificate.

2.5.3 Tools:

- Energy assessment of a new building
- Energy certificate for an existing building
- Calculating energy efficiency in repairs and alterations
- Decree 1010/2017 of the Ministry of the Environment
- Annual efficiency of ventilation heat recovery
- calculation of solar collector yield, calculation of solar cell yield

Videos
Demonstration of monthly method EPC
https://vimeo.com/398583110

2.5.4 Target groups: Construction experts and energy experts.

2.5.5 Business Model: Saving building data is not possible with the free version. It is possible to purchase the app, allowing you to save your own projects.

2.6 Eksergia.fi

https://eksergia.fi/en/introduction-of-bim-enabled-epc-assessments/

Eksergia.fi is an open e-learning portal gathering most essential and objective information about energy efficient buildings and renewable energy into one place. Eksergia.fi is founded by Civil Engineer Maaria Laukkanen and it is produced in multinational BIMEET -project funded by the EU (http://www.bimeet.eu).

2.6.1 Topics covered:

Open Web School of Energy Efficient Buildings.

2.6.2 Contents:

Most of the content is in Finnish but in English, too. There are presentation slides (you can choose between Finnish or United Kingdom perspective), quizzes and the lecture videos that are very helpful if you use the laskentapalvelut.fi program or IDA ICE. Lecture videos: “How a monthly method EPC calculation tool works –Laskentapalvelut.fi” and “How to import IFC file to dynamic calculation tool – IDA ICE (By Equa Simulation AB)”

2.6.3 Tools:

No actual tools but ***lecture videos that help you to use Laskentapalvelut.fi or IDA ICE programs. See the previous page!***

2.6.4 Target groups:

Course increases overall understanding of BIM, EPC and energy efficiency, and is hence beneficial to anyone working in the construction sector. The material is useful both for teaching and self-learning.

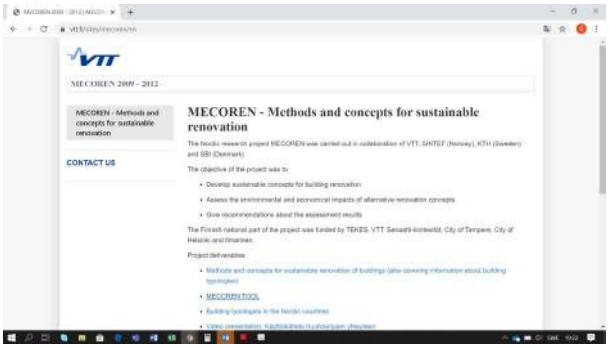
2.6.5 Business Model:

The courses and materials are free.

2.7 Mecoren

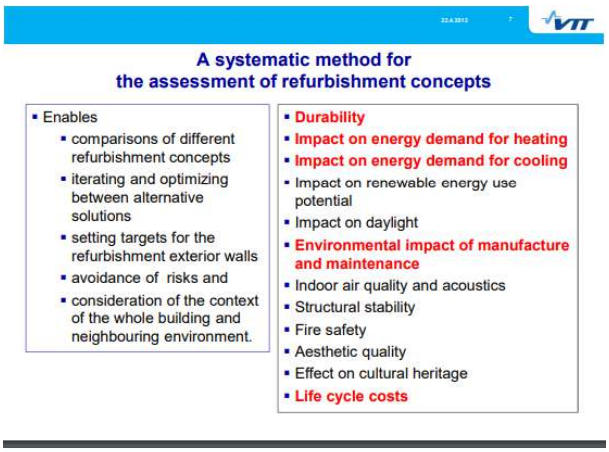
http://www.vtt.fi/sites/mecoren

The Mecoren was a research project for developing methods and concepts for sustainable renovation. The project was a Nordic collaboration between VTT in Finland, SINTEF in Norway, SBI in Denmark and KTH in Sweden. The project was active during 2009-2012.



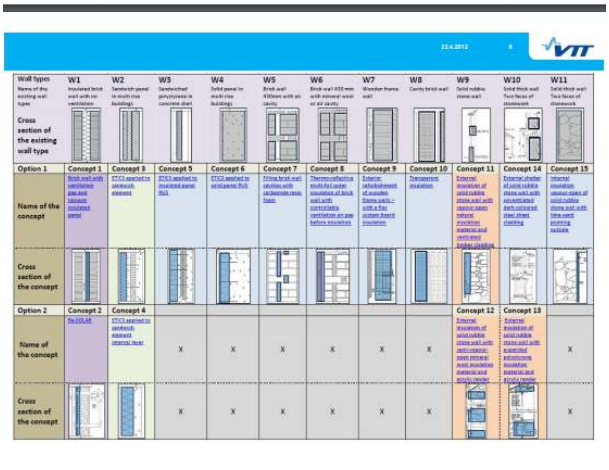
2.7.1 Topics covered:

Methods and concepts for sustainable renovation of building. Only text and pictures.



2.7.2 Contents:

Mainsite where you can find the links for renovation studies and presentations from research seminar:
https://projectsites.vtt.fi/sites/mecoren/www.vtt.fi/sites/mecoren/en.html



Final raport: Sustainable refurbishment of exterior walls and facades (Parts A, B & C):

- Part A – Methods and recommendations
- Part B – General refurbishment concepts
- Part C - Specific refurbishment concepts

2.7.3 Tools:

The calculation site doesn't excist any more.

2.7.4 Target groups:

residents, owners, and housing companies as well as professional real estate maintenance companies.

2.7.5 Business Model:

free to use

2.8 Suomirakentaa

https://www.suomirakentaa.fi/

Suomirakentaa is an informational service for builders and renovators and is maintained by private organization Rakennustutkimus RTS Oy.

2.8.1 Topics covered: Repair counter is a new service in the site. Suomirakentaa provides general guidelines on renovation and introduces different manufacturers, too. Only in Finnish language

2.8.2 Contents: A tool to help you calculate the cost of a renovation or the building cost of a new house.

2.8.3 Tools:

Repair counter:
https://www.suomirakentaa.fi/kustannuslaskurit/
First you choose if you want to carry out an exterior renovation, an interior renovation or a building services renovation. The price level for the counter is May 2019. Select the net square footage of your house (the total area of the house, calculated according to the interior surface of the exterior walls). Then make “quality corrections” to 20 building block phases using grades 1-5 stars. In the end, you get an estimate of the total cost of your renovation.

2.8.4 Target groups: Advice for builders and renovators.

2.8.5 Business Model:

Free

2.9 Timbal palvelut Oy

www.timbal.fi

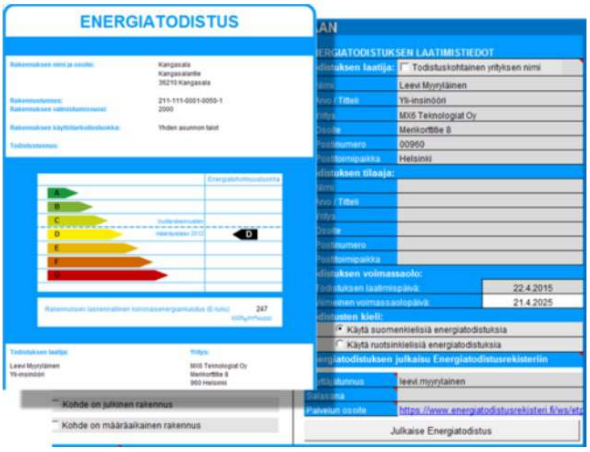
Timbal Palvelut Oy is an information technology company that develops specially software and solutions for renovation cost and property stock budgeting, building energy efficiency, energy certificate accounting and building lifecycle management. The headquarter is in Helsinki.

2.9.1 Topics covered: Calculation and comparison of energy subsidy.

2.9.2 Contents: With Timbal Energy software you can do the necessary energy saving calculations.

2.9.3 Tools:

With **Timbal energy software** calculate energy certificate of the building**,** simulate 10 different scenarios of a building and compare their impact over a longer period of time. You can calculate the operating costs of the building and the investment are compared with the original building. The program will automatically see if the planned energy efficiency improvement measures allow for energy subsidies



Timbal pro software for people who manage several properties and buildings. Another large group of users are renovation experts and professionals

2.9.4 Target groups: Owners of detached houses, semi-detached houses and chain houses**,** apartment and terraced companies**,** entities that own state-funded rental housing and right-of-occupancy housing

2.9.5 Business Model: Timbal energy software is free during the trial period

2.10 Sun energia

https://app.sunenergia.com/

Sun Energia is a Finnish clean-tech start-up founded in June 2014. They provide property owners with high-quality, reliable information about the solar radiation their roof receives and the true solar production and savings potential of each building.

2.10.1 Topics covered:

Suitable for existing building in Finland. Only the exact address, the building year, base area and the and the annual energy consumption is needed. Easy and useful program.

2.10.2 Contents:

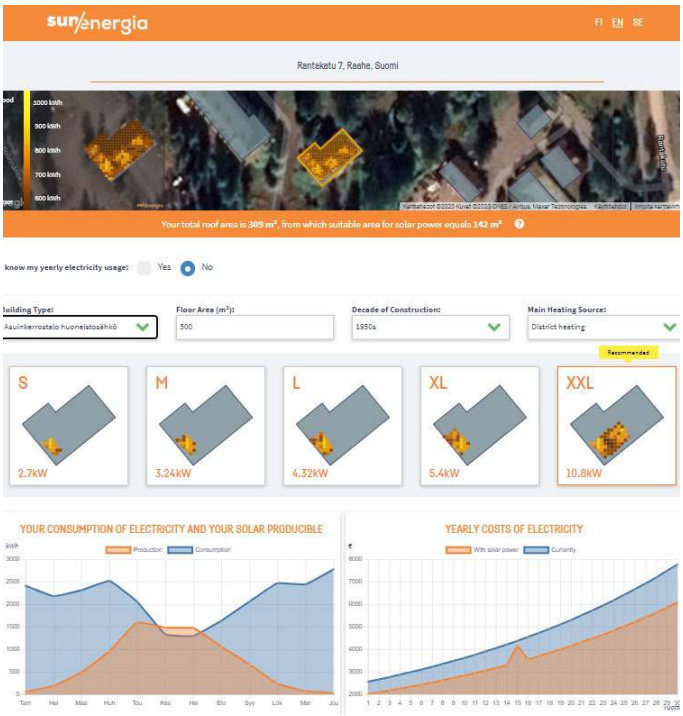
Solar energy production calculator in web. The annual energy consumption of the building is given by user as well as the exact address. The amount of solar energy is analyzed for each ceiling surface using local weather data. Cloud cover, temperature, and other factors are taken account and affect solar energy production.

2.10.3 Tools:

The program uses open data created by the National Land Survey of Finland, licensed under a Creative Commons Attribution 4.0 International license (link is external). The exact address of the building is asked and the program finds the building. Works only in Finland!

2.10.4 Target groups: Energy experts and property owners.

2.10.5 Business Model: The basic counter is free but the companies are able to attach the counter to their own webpage for a monthly fee of €49.



2.11 Talopeli

www.talopeli.fi

Talopeli is developed by Visual Computing Ltd in cooperation with several other partners.

2.11.1 Topics covered: Talopeli is cost calculation and budgeting software. There are the links to Remonttilaskuri (Renovation counter) and Hometalkoot (How to find moisture damages) -websites.

2.11.2 Contents: Talopeli is cost calculation and budgeting software. It is a game-like planning tool for building houses, it has also information on renovation and energy efficiency.

2.11.3 Tools:

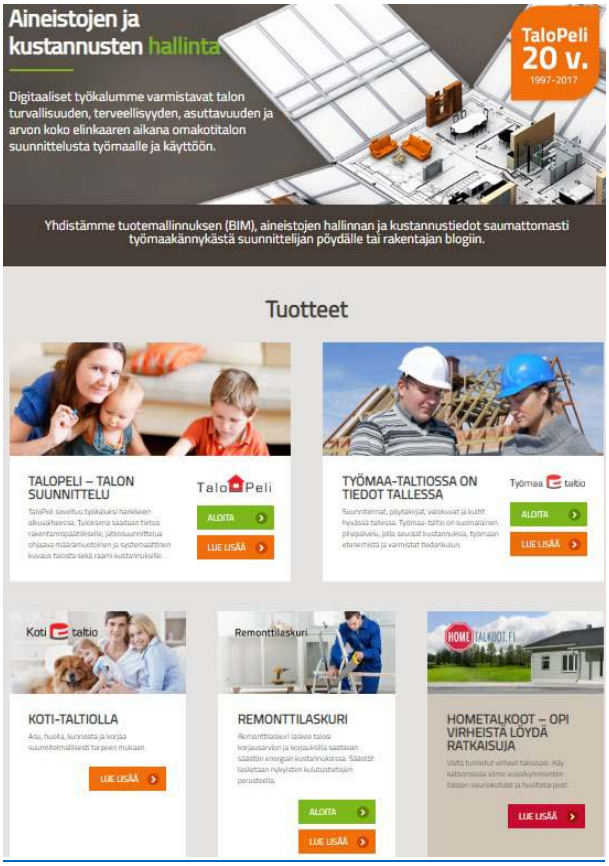
Remonttilaskuri -counter
Renovation counter for timber-framed houses built in 1950-2000.

Link to Hometalkoot website
Instructions for finding and preventing moisture damages in houses of different decades.

2.11.4 Target groups: It is extremely useful for families who are planning to build a house.

2.11.5 Business Model:

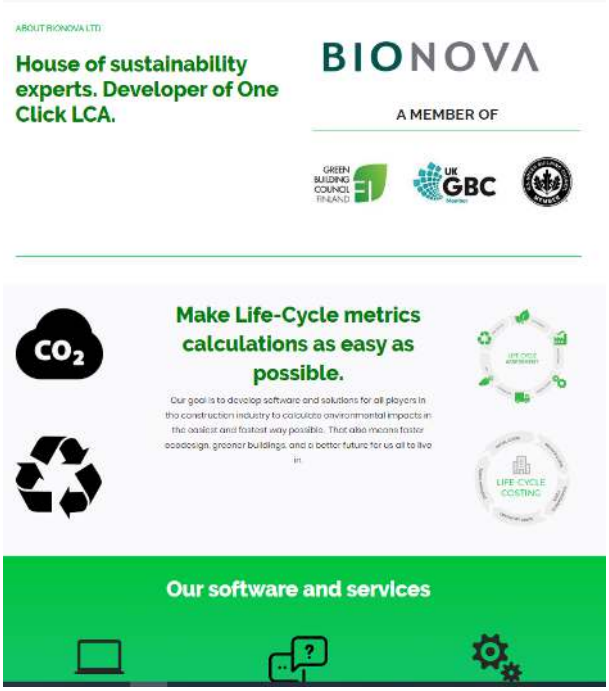
Free



2.12 One Click LCA (by Bionova Ltd)

https://www.oneclicklca.com/about-bionova-ltd/

Bionova Ltd is a Finnish, privately owned and profitable company. They have developed Tools for Life Cycle Assessment.



2.12.1 Topics covered:

With the One Click LCA tool you can make Life-Cycle metrics calculations easily, for example Building Carbon Footprint calculations. Website is in English and in Finnish.

2.12.2 Contents:

The One Click LCA is a comprehensive tool for calculating.
Website includes also guides of Life Cycle Assessment and Life Cycle Costing (LCC assesses all costs that occur over the building's lifetime including construction costs, maintaining, operating, and end-of-life related costs), EPD, Embodied Carbon and Net Zero Carbon.
The guide videos are free to watch and with them you can study the issue quite easily.
There are also several webinars on the site.

2.12.3 Tools:

The tool is called One Click LCA and you can use it for free during 14 days if you sign in and ask for a trial licence. After that you you are able to burghase the tool. If you wish to use One Click LCA for a research project, request for research license.

2.12.4 Target groups: Sustainability consultant, energy advisors, engineers, architects, ect.

2.12.5 Business Model:

For business use you have to purchace a commercial licence.

3. Ireland

3.1

RETROKIT

3.1.1 Topics covered:

Retrofitting of existing homes

3.1.2 Contents:

Online Tool to allow calculation and specification of retrofitting costs

3.1.3 Tools:

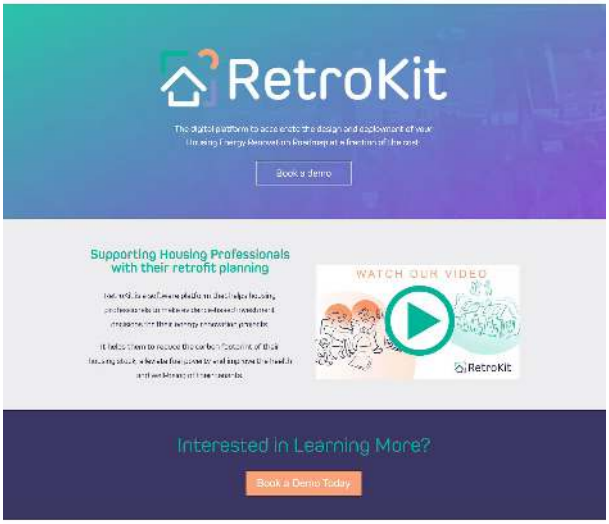
RETROKIT

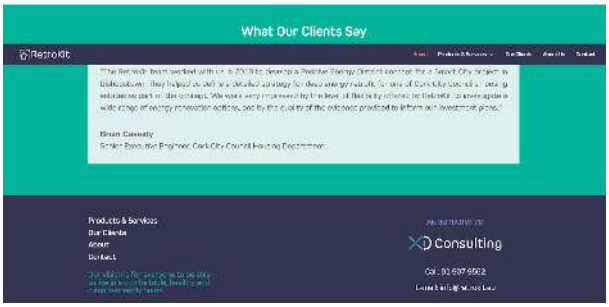
3.1.4 Target groups:

Social housing owners, home owners, tenants

3.1.5 Business Model:

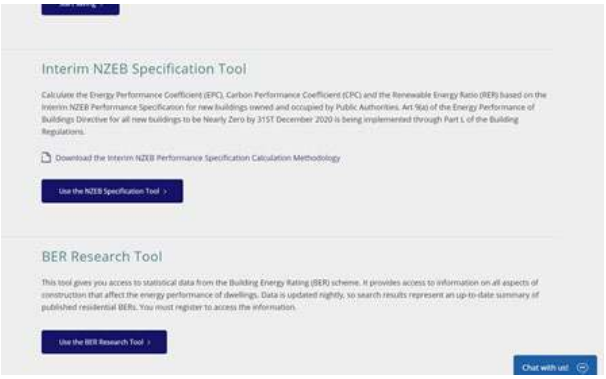
Selles access to the Tool, training and consultancy





3.2 Sustainable Energy Authority of Ireland (SEAI)

https://www.seai.ie/tools/



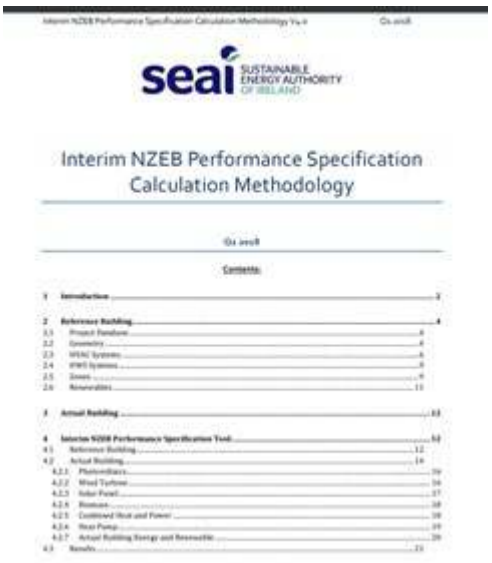
The Sustainable Energy Authority of Ireland (SEAI) offers a number of online calculation tools that can be downloaded (Excel Spreadsheets) While these are not online tools, they are calculators.

3.2.1 Topics covered

There are a number of energy saving calculators provided however many are not relevant to historic buildings.

The two that may be helpful to the project are:

- Interim NZEB Specification Tool



3.2.2 Contents:

Interim NZEB Specification Tool

- Includes pdf download of Interim NZEB Performance Specification Calculation Methodology
- Downloadable Excel Spreadsheet which includes formulas for calculations.

3.2.3 Tools:

PDF manual and easy to use Excel spreadsheet

3.2.4 Target groups:

Business and domestic owners and users and Assessors

3.2.5 Business Model: Free

4. Sweden

4.1 Belok http://belok.se/

Belok has produced a number of guidelines and free tools that guide you through the planning and implementation of energy efficiency projects.

4.1.1 Topics covered:

Energy efficiency measures

4.1.2 Contents:

The program is used to calculate and show the profitability of measures as a package. With the help of Totalverktyg energy efficiency measures are ranked on the basis of profitability and a common internal rate of return is calculated for the entire action package.

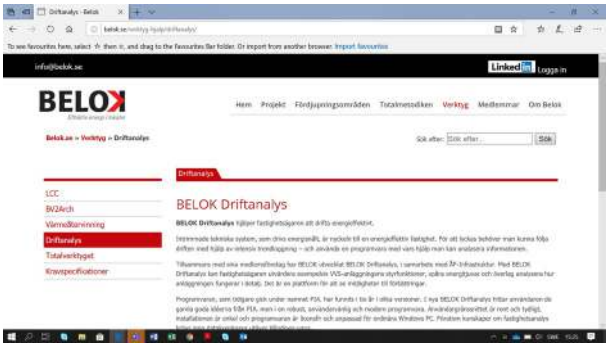
4.1.3 Tools:

The Totalmetodik" takes a holistic approach on building's energy use in order to achieve as high energy savings as possible while considering the property owner's profitability requirements. The method is about implementing several measures in a package of measures that in their entirety meet the property owner's requirements return on invested funds, expressed as discount rate. By working with packages instead of individual measures, one may be able to take-in measures that are unprofitable on their own, but which contributes to increased energy efficiency. Totalverktyg, is important tool in Bilok's Totalmetodik.

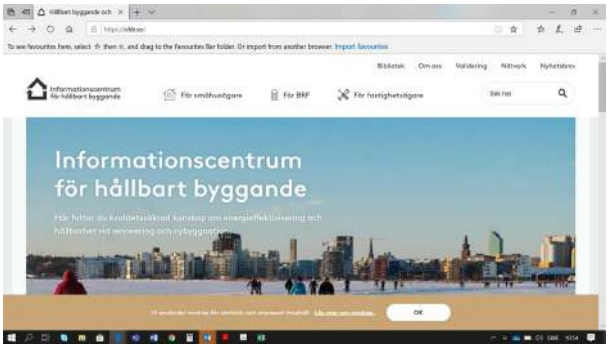
4.1.4 Target groups:

They are aimed at anyone who works with "Totalprojekt" and energy-efficiency implementation in building properties such as property owners, property managers, consultants, planners and others key actors who will be involved in the implementation of projects

4.1.6 Business Model: Free



4.2 Informationscentrum för hållbart byggande Hållbart byggande och renovering - ICHB



ICHB aims to promote increased energy efficiency in renovation and energy-efficient construction with the use of sustainable materials and low climate impact from a life cycle perspective. ICHB is Supported by Swedish National Board of Housing (Boverket)

4.2.1 Topics covered: Heat pumps. Ventilation, solar PVs, Sustainable materials, Sustainable renovation and maintenance of buildings

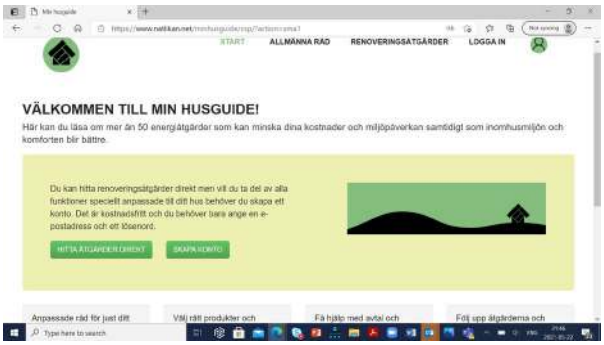
4.2.2 Contents: Reports, articles, research on energy efficiency, tips to reduce energy use, guide to reduce energy use for single-family households is connected to natlikan.net

4.2.3 Tools: Guide and information material

4.2.4 Target groups: Professional builders, owners of detached houses, board members of tenant-owner associations or property owners, or anyone involved in the construction process in some way

4.2.5 Business Model: Free

4.3 Natlikan natlikan.net



The guide has been developed with Sustainable Innovation in collaboration with BeSmå and with broad support of industry and interest associations, energy offices, energy and climate advisers, energy companies, insurance companies and banks. The consulting company WSP has built the website. The Swedish Energy Agency has part-financed the development of this site.

4.3.1 Topics covered:

The website provide information on more than 50 energy efficiency measures that could reduce the energy cost and improve the indoor thermal comfort

4.3.2 Contents:

Information on measures that could reduce energy use and improve thermal comfort in single-family households

4.3.3 Tools: Guide

4.3.4 Target groups: Single-family house owners or actors dealing with single-family houses

4.3.5 Business Model: Free, one need to login to get all the information in the website

5. UK

5.1 STBA Retrofit Guidance Wheel

http://responsible-retrofit.org/wheel/

"The Wheel is both an aid to decision making and a way of learning about traditional building retrofit". It is one of the exhaustive online free tool available for renovation of traditional building. The Wheel has more than 50 measures used for the retrofitting or refurbishing of traditional buildings. The Wheel has been developed by the Sustainable Traditional Buildings Alliance (STBA) and funded by the Department of Energy and Climate Change (DECC). The Wheel is free to use. DECC has the copyright of the Wheel.

5.1.1 Topics covered:

The tool considers all parts of the renovation process. This includes building elements and materials as well as insulation, services such as lighting, heating and ventilation.

5.1.2 Contents:

The tool is looking at relationships between different elements. It also gives the advantages and disadvantages of different measures. It is easy to use.

5.1.3 Tools:

- Connecting relationships between different retrofit measures
- Advantages and disadvantages of measures
- List of possible measures when searching a particular topic such as 'insulation'
- Information about concerns and action

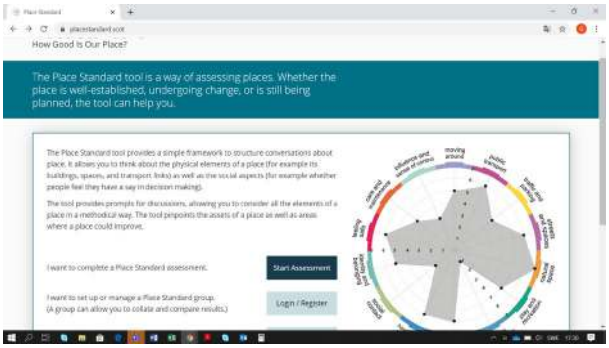
5.1. 4 Target groups:

Planners, traditional building owners, architects – designed to inform stakeholders and end users.

5.1.6 Business Model: free online tool

5.2 Place Standard

https://www.placestandard.scot/



The Place Standard is a tool that can be used to assess the quality of a places including the places that are well established, undergoing change or still being planned. The objective of the tool is to maximize the potential of the physical and social environment to support health, wellbeing and to have a high quality of life.

5.2.1 Topics covered: Assessing the quality of a place, both rural and urban, to the scale of a neighborhood or whole towns.

5.2.2 Contents:
- health and wellbeing
- participation, empowerment

Meant to create better places both during the planning phase and after completion. It can also harness the distinct characteristics of places.

5.2.3 Tools:

The tool is free to use and is based on 14 questions (and giving them a score) covering both physical and social aspects of a place. Detailed and quick guide is provided.

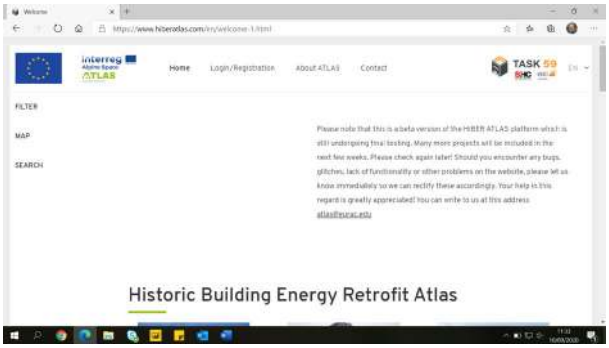
5.2.4 Target groups: for everyone: communities, the public sector, private sector, NGOs. For example, if somebody think their neighborhoods could be improved then they can use the Place Standard tool with the family, neighbours or community to prioritize which changes would make a real change to one's life.

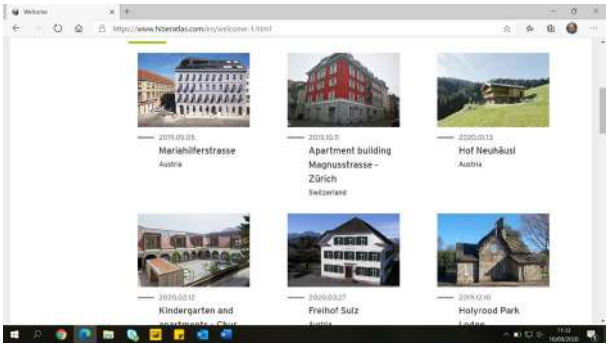
5.2.5 Business Model: Free to use

5.3 Historic Building Energy Retrofit Atlas

https://www.hiberatlas.com/en/welcome-1.html

Developed by the Historic Near Zero Energy Building project, this is a collection of case studies in different European countries with best practice energy retrofits.





5.3.1 Topics covered: Renovations of traditional buildings, including best practice solutions.

5.3.2 Contents:
The atlas consists of individual case studies, showing before and after images and describing the measures. This includes energy savings, costs and similar. Easy to use.

5.2.3 Tools:

Examples of measures possible in different scenarios and heritage significances. This includes a wide variety of building materials in different geographic locations.

5.2.4 Target groups: Best practice buildings for planners, homeowners and heritage professionals

5.2.5 Business Model: Free to use

5.4 Embodied Carbon – the ICE Database

https://circularecology.com/embodied-carbon-footprint-database.html

The Inventory of Carbon and Energy (also known as the ICE database) includes information about the embodied carbon for building materials, which is available for free.

5.4.1 Topics covered:

Embodied carbon in materials used in the building industry (not all traditional buildings and materials).

5.4.2 Contents:

The database is downloadable from the website. It also includes additional tools such as an embodied carbon calculator for concrete.

5.4.3 Tools:

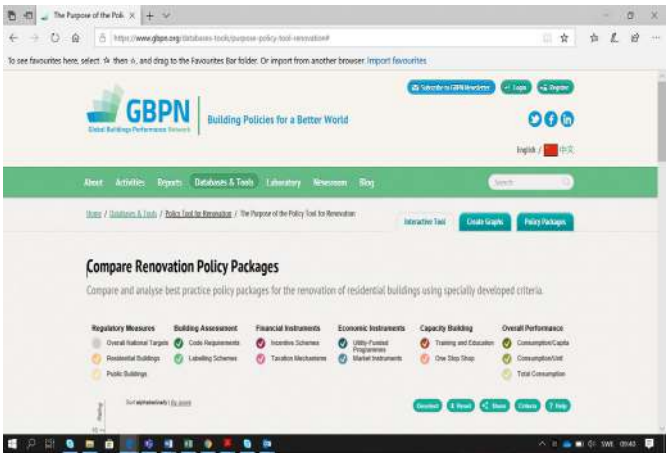
Provides a database of materials and their embodied carbon. Contains 200 materials, broken down into 30 main categories such as bricks, dement, concrete, glass etc.

5.4.4 Target groups:

Professionals from around the world

5.4.5 Business Model: Free to download from the website

5.5 Home Energy Scotland website



https://www.homeenergyscotland.org/make-my-home-warmer/

Funded by the Scottish government, this website gives about energy reduction measures.

5.5.1 Topics covered:

Energy reduction and bills in existing buildings (not only traditional).

5.5.2 Contents:

This website gives useful advice and links to funding sources about energy reduction. This includes retrofit measures such as insulation and home renewables systems.
It is easy to use and

5.5.3 Tools:

The organization offers stories of green homes near the person.
Tool to get details and reviews of accredited installers.
Calculator assessing the suitable options of greener energy.

5.5.4 Target groups:

End users

5.5.5 Business Model: Free to use

6. Others

This section provides a brief information of a few other computer-based tools for identification, assessment and selection of retrofit solutions in historical buildings. For further information on these tools refer Buda et al. (2022).

6.1 Responsible Retrofit Guidance Wheel (French version)

https://www.rehabilitation-bati-ancien.fr/guidance-wheel

It is developed by Sustainable Traditional building alliance and CREBA.
The tool helps to identify the benefits of retrofit measures while providing risks associated.

6.2 exDSS

https://cfc.exdss.org/dss/riskcon

It is a beta version developed as part of the Climate for Culture project (2009-2014). The tool is developed as an open source software and aims to assess the hygrothermal risks in historical buildings. It has three parts: Future outlook, Risk assessment and Indoor climate control methods.

6.3 Effesus DSS/RE2H

This tool is developed with in EFFESUS project and the tool support planning and renovation of historical building on an urban district level.

6.4 PETRA

PETRA (Platform for Energetic and Technological Retrofit in Architecture) is a tool developed by a consortium of organizations from Switzerland that include SUPSI, Swiss Federal Institute of Technology and three private companies. PETRA requires registration in the website and it offers DSS tools for the implementation of retrofit solutions that comply Swiss regulations (Branca et al., 2012).

6.5 DEMI MORE

https://maakmonumentenduurzaam.eu/wp-content/uploads/2019/12/DEMIMORE.BWF_.41.outil-visuel.pdf

DEMI MORE is a visual decision tool available in French and Dutch. The tool follow the stages defined in EN 16883:2017 for overall conservation process of the historical building. The aim of the tool is to guide the users through the process through checklist and references to existing guidelines and standards in Netherland and Belgium (Buda et al., 2022). It is not exactly an online wherein a user can receive concrete retrofit soultions.

6.6 RIBuild tool https://www.ribuild.eu

It is an online beta version tool that provides several internal insulation solutions for historical buildings. It is developed as part of H2020 EU project. The tool has 4 steps (i) goal setting for renovation, (ii) deciding on thether the building is suitable for internal insulation, (iii) what kind of insulation to be selected, (iv) how to evaluate the environmental impact and LCC of solutions.

Reference

Buda, A., Gori, V., Ernst Jan de PlaceHansen., C.S. Polo López., Marincioni, V., Giancola, E., Vernimme, N., Egusquiza, A., Haas, F., Herrera-Avellanos, D., 2022. Existing tools enabling the implementation of EN 16883:2017 Standard to integrate conservation-compatible retrofit solutions in historic buildings. Journal of Cultural Heritage 57, 34-52.
Branca, G., Colombo, L., Rudel, R., Tamborini, D., Strepparava, D., Ortelli, L., Thal-mann, P., Flourentzou, F., Genre, J.L., Kaehr, P., 2012. Computer-based tool PETRA for de-cision-making in networks about the maintenance and renovation of a mixed building estate, Swissbau.