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Abstract:

This deliverable contains the final version of the communication and exploitation plan for RIBuild. The draft version of the Exploitation Plan based on the outcome of the Exploitation Strategy Seminar held in Leuven 17 November 2017 is updated based on the progress on exploitable results and decision concerning hosting/managing the RIBuild products after closing the project. Version 2.0 is a revised version handling comments from reviewers.

Keyword list: Communication plan, exploitation plan

Table of Contents

ABBREVIATIONS	3
EXECUTIVE SUMMARY	4
1 INTRODUCTION	5
2 COMMUNICATION PLAN – FINAL	6
2.1 BACKGROUND AND OBJECTIVES.....	6
2.2 PARTICIPANTS AND PROJECT IDENTITY	6
2.3 MESSAGES	7
2.4 TARGET AUDIENCE AND CHANNELS	8
2.5 ACTIVITIES.....	9
2.6 SCHEDULE FOR DELIVERABLES	16
2.7 RESOURCES.....	16
2.8 BUDGET	17
3 EXPLOITATION PLAN – FINAL	18
3.1 BACKGROUND AND OBJECTIVES.....	18
3.2 CHARACTERIZATION OF THE WEB TOOL	18
3.3 HOW TO EXPLOIT THE WEB TOOL	22
3.4 THE PARTNERS’ CONTRIBUTION (GROUND IDENTIFICATION).....	23
3.5 RISK ASSESSMENT	25
4 REFERENCES	26
APPENDIX 1 NETWORK PARTNERS	27

Abbreviations

AAU	Aalborg University, Denmark
CIB	International Council for Research and Innovation in Building and Construction
D	Deliverable
DBMC	International Conference on Durability of Building Materials and Components
DTU	Technical University of Denmark
EEHB	International Conference on Energy Efficiency of Historic Buildings
ERIK	ERIK Arkitekter, Denmark
HES-SO	Haute Ecole Spécialisée de Suisse Occidentale (University of Applied Sciences Western Switzerland), Switzerland
ICT	Insulation Calculator Tool
IFLEX	INTRO FLEX ApS, Denmark
KER	Key Exploitable Result
LCA	Life Cycle Assessment
LCC	Life Cycle Cost
NSB	Nordic Symposium on Building Physics
PM	Person Months
RIBuild	Robust Internal Thermal Insulation of Historic Buildings
UNIVPM	Università Politecnica delle Marche
W	CIB Working Commission
WP	Work Package

Executive Summary

The general objective of RIBuild is to develop effective, comprehensive decision guidelines to optimize the design and implementation of internal thermal insulation in historic¹ buildings across the EU (Figure 1). RIBuild focuses on heavy external walls made of stone, brick and timber framing, as most historic buildings are made of these materials.

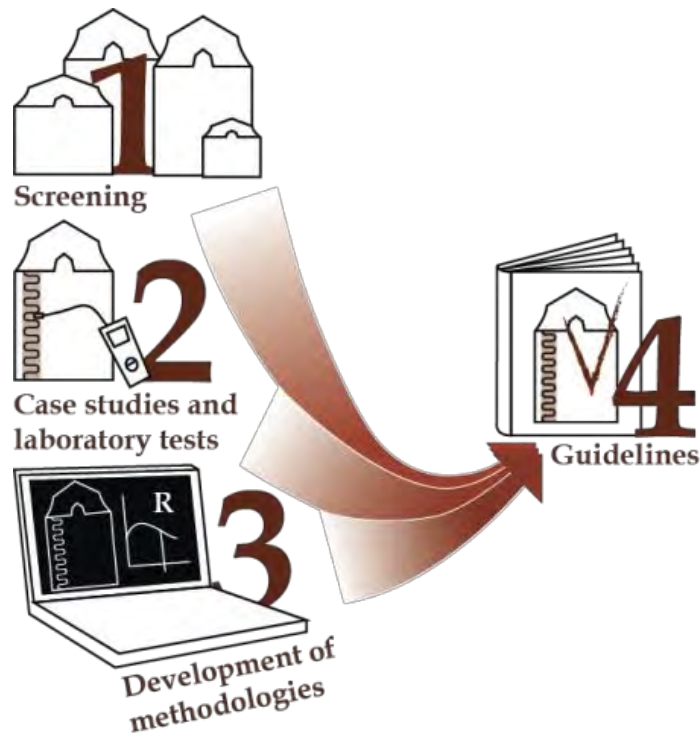


Figure 1: The research activities in RIBuild

First, the communication plan describes how RIBuild intend to communicate those results of the project that are relevant to public authorities, building owners, consulting engineers and other professional practitioners within the construction industry in the Member States, secondly how RIBuild intend to spread the results among international academics. The ultimate goal is to improve knowledge among practitioners about when internal insulation is an adequate measure in historic buildings and by which methods. A subordinate goal of the project could be to point out new areas of research. Also it is desirable if some of the research results can be used in industrial innovation of new products and methods.

The exploitation plan describes the most relevant key exploitable project result (KER) and describes how it will be exploited, and what the intentions of each partner are with regard to the dissemination and use of the KER. The exploitation plan is developed based on an Exploitation Strategy Seminar held in Leuven 17 November 2017 and updated afterwards to show the present status regarding hosting key projects results. It was decided to focus the exploitation plan on one KER: The web tool as this will be a relevant KER for the practitioners. The practitioners are seen as the main target group for the outcome of the RIBuild project.

¹ Buildings constructed before 1945/1950

1 Introduction

This document describes RIBuild deliverable 7.12 ‘Communication and Exploitation plan – final’. Dissemination and communication is an ongoing activity in the RIBuild project. Therefore the communication plan will address this process, as many of the planned activities has taken place when this report is written and are no longer scheduled to take place. The exploitation plan will address how and for what purpose the key exploitable results of the project will be used by the target group of the RIBuild project.

2 Communication plan – final

2.1 Background and objectives

RIBuild will develop guidelines for securing the robustness of internal thermal insulation of historic buildings through a pre-renovation assessment of the existing structures. Further, it includes a feasibility study of possible input and output data for a web tool to demonstrate and evaluate, if the tool can be used for decision making on whether a wall is suitable for internal insulation. Significant energy savings are expected depending on selected building practice.

It is vital to reduce the energy consumption of the European building stock as approximately 40 % of the energy consumption in Europe is attributable to housing, offices, shops and other buildings across the public and private sectors.

In many European countries, the implementation of the Directive on the Energy Performance of Buildings (EPBD) has reduced the energy consumption of new buildings within the last 10 years. However, new buildings increase the building stock by only around 1-1.5% every year, while the renovation rate is about 1.2-2 % per year (European Commission, 2010, p.9), (Renovate Europe Day, 2012) and considering the current rates of construction, demolition, and renovation across Europe, around 80 % of the 2030 building stock and 70 % of the 2050 building stock is already built. Today 30 % of existing buildings are historic buildings (European Commission, 2010, p.18) and as they are less energy-efficient than new buildings they account for more than 30 % of the energy consumption in buildings.

RIBuild is funded by the European Union under the Work Programme EE3-2014: Energy strategies and solutions for deep renovation of historic buildings. The objectives of WP 7, *Communication and dissemination*, is first of all to communicate those results of the project that are relevant to public authorities, building owners, consulting engineers and other professional practitioners within the construction industry in the Member States, secondly to spread the results among international academics. The ultimate goal is to improve knowledge among practitioners about when internal insulation is an adequate measure in historic buildings and by which methods. A subordinate goal of the project could be to point out new areas of research. Also it is desirable if some of the research results can be used in industrial innovation of new products and methods.

2.2 Participants and project identity

Eight universities and two firms from seven different countries in Europe participate in RIBuild:

- Aalborg University, Denmark
- Riga Technical University, Latvia
- Katholieke Universiteit Leuven, Belgium
- Technische Universität Dresden, Germany
- Università Politecnica delle Marche, Italy
- Technical University of Denmark
- RISE Research Institutes of Sweden
- Haute Ecole Spécialisée de Suisse Occidentale, Switzerland
- INTRO FLEX ApS, Denmark
- ERIK Arkitekter, Denmark

WP7 designed a logo for RIBuild, shown in Figure 2. The project name “RIBuild” is a central part of the logo, and the logo reflects, that the project concerns internal insulation of historic buildings. The logo is used together with the EU logo in all RIBuild materials.



Figure 2: The RIBuild logo.

Moreover WP7 launched a website www.ribuild.eu in April 2015 (Figure 3) which contains both the RIBuild logo, the participant logos and the EU logo.



Figure 3. Front page. Screen dump from original version of www.ribuild.eu, active during the project lifetime (2015-2020)

The participant logos links to information about the participants and their contribution to the project. The participants had the possibility of leaving their mark on some parts of the website, see Section 2.5. The website was in June 2020 launched in version 2.0 after a redesign focusing on presenting the RIBuild guidelines for internal insulation.

2.3 Messages

The central message of RIBuild reflects the European effort to save energy by renovating and energy updating historic buildings. Moreover the central messages reflect the scientific results that are relevant to the target audience. WP7 evaluates research results as they appear in terms of relevance to practice and ensures, that the central messages will be disseminated and repeated in all relevant communication channels.

2.4 Target audience and channels

The primary target audience is public authorities, building owners, consulting engineers, architects and other professional practitioners within the construction industry in the Member States. The secondary target audience is international academics. A third target audience is the RIBuild participants. WP7 has established a project website to both ensure communication between the participants and inform external users about RIBuild. The communication between participants took place at the SharePoint site: <https://aaudk.sharepoint.com/sites/RIBuild>, while external users can find information about RIBuild on the website: www.ribuild.eu. During the project lifetime (2015-2020) www.ribuild.eu contained news about the project while it was ongoing, including announcement about events where RIBuild presented results from the project (cf. Section 2.5.8). In the final year, a redesigned version of the website was developed, tested and launched, focusing on the guidelines, including illustrative videos, etc.

The primary target audience need information about the result that are relevant to their work. Preferably this information should be in their national language. Therefore this information will both be distributed in English on the website and through network partners in the seven countries that participates in RIBuild. The network partners could be national organizations, trade media and public authorities. It was important to select those network partners that the primary audience already use, when they search for information about building renovation and energy upgrading.

The network partners received information through the website, newsletters, videos, one seminar in the beginning of the project, and local seminars at the end of the project. The local RIBuild participants helped establishing and maintaining contact with networking partners in their country, see Section 2.5.2 and 2.5.3.

The secondary target audience (the international academics) need information of scientific value. The project resulted in a large amount of new knowledge of interest to at least three different groups of the international academic community:

- those who do research on building physics (heat, moisture, air tightness and thermal insulation),
- those who do research on energy efficiency of buildings,
- those who do research on refurbishment and maintenance of buildings worth of preservation.

Results of the project has been spread among all three groups by publishing in scientific journals, such as 'Journal of Building Physics', 'Energy and Buildings' and 'Journal of Architecture'. Moreover, results of the project has been and will be presented at international scientific conferences and committees, such as 'Nordic Symposium of Building Physics' (NSB), 'Durability of Building Materials and Components' (DBMC), 'Energy Efficiency of Historic Buildings' (EEHB) and CIB W086 Building Pathology.

Table 1 gives an overview of the primary and secondary audience, their interest in building renovation, energy upgrading and scientific results of RIBuild and their need for information.

Table 1: Overview of the primary and secondary audience, their interest in building renovation, energy upgrading and scientific results of RIBuild and their need for information

Target audience	Priority	Interest
Public authorities	1	Results that will potentially alter the national building regulations. Results that make it possible to reduce energy consumption in historic buildings without altering their original appearance.
Building owners	1	Results that make it cost efficient to reduce energy consumption in historic buildings without altering their original appearance.
Consulting engineers	1	New technical methods. Building regulations.
Architects	1	Renovating building without altering their original appearance. Building regulations.
Other professional practitioners within the construction industry	1	New practical solutions that are easy to implement. Building regulations.
Researchers on building physics	2	Scientific results about building physics (heat, moisture, air tightness and thermal insulation).
Researchers on energy efficiency of buildings	2	Scientific result about energy efficiency of buildings.
Researchers on refurbishment and maintenance of buildings	2	Scientific results about refurbishment and maintenance of buildings.
Participants in RIBuild	3	Internal project communication and dissemination of the scientific results.

2.5 Activities

WP7 kept track of and coordinated the overall communication of the RIBuild project. Project communication activities and dissemination activities was monitored at the RIBuild SharePoint site. Further, the overview of the communication activities is enclosed as Appendix 2 to (RIBuild Deliverable D7.4-6-7-10, 2020). It shows that more than 50 different activities has taken place, including interviews for radio and magazines/journals, exhibition stands and posters at fairs and seminars, presentation at conferences and workshops, etc., ensuring that results and news from RIBuild have reached a wide audience. And even more activities has taken and will take place, as the overview is not complete regarding presentations of papers at conferences; see Appendix 1 in (RIBuild Deliverable D7.4-6-7-10, 2020) for an overview of journal and conference papers.

AAU were leading WP7. All the participants of RIBuild were involved to ensure a thorough communication of the findings of the project through their existing networks of professional practitioners and academics. The activities are divided into three main tasks and eleven deliverables (D) with a lead partner as shown in Table 2.

Table 2: Activities and involvement of other participants

Deliverable	Activity and lead partner	Involvement of other project partners
<i>Communication with professional practitioners</i>		
D7.1	Procedure for evaluating research results in terms of relevance to practice (AAU)	Project partners has received information about the procedures and has commented on the procedures
D7.2	Map of Member States' relevant professional networks (AAU)	Project partners in member states has pointed out the local network partners has ensured that they target the primary target audience.
D7.3	Formation of network partnerships (AAU)	Project partners in member states has contacted the network partners.
D7.4	Production and distribution of a number (>5) of information kits on basis of the project's results (AAU)	Project partners ensured scientific correct information in the information kits
D7.5	A seminar at the beginning of the project (AAU)	Project partners in member states has motivated the local network partners to take part in the seminars.
D7.6	A conference at the end of the project (AAU)	Project partners in member states must motivate the local network partners and fellow researchers to take part in the conference.
<i>Spreading results among international academics</i>		
D7.7	A number (>20) of journal and conference papers (all)	Project partners must contribute with at least 20 articles that can be distributed in scientific journals and at international conferences. In the end, almost 80 journal and conference papers will be published, excluding PhD- and MSc theses
<i>General project communication</i>		
D7.8	A project website with templates for reporting, project descriptions, press material etc. (AAU)	Project partners filled in content on the part of the website that describes activities in their country
D7.9	A press release in the beginning of the project (AAU)	Project partners has ensured scientific correct information in the press releases
D7.10	A press release at the end of the project (AAU)	Project partners did ensure scientific correct information in the press releases
D7.11	A draft of a communication and exploitation plan (AAU)	Project partners did ensure the ongoing development and the execution of the plans
D7.12	A final communication and exploitation plan (AAU)	Project partners did ensure the development and execution of the plans

2.5.1 Procedure for evaluating research results in terms of relevance to practice (D7.1)

Some of the project's results are relevant to public authorities, building owners, consulting engineers etc., and others are not. The procedure for evaluating research results describes how to select the results which should be given priority and how to communicate these effectively, as this vary considerably depending on the nature of the specific results. The lead of this subtask has set up procedures to ensure that all results are properly handled in this respect. The procedure is developed

by internal communication professionals who are experienced in building research communication. The result of this work is documented in D7.1 Procedure for evaluating research results at www.ribuild.eu/knowledge-base

2.5.2 Map of Member States' relevant professional networks (D7.2)

It is expected that the most effective method to communicate the project's research results goes through networks that the target audience are already used to use when searching for new knowledge on energy upgrading and building renovation. These networks are constituted by national organizations, trade media and public authorities. The mapping of these networks is documented in D7.2 Mapping of networks at www.ribuild.eu/knowledge-base.

2.5.3 Formation of network partnerships (D7.3)

Local participants have helped to establish partnerships with institutions with well-established relations to the different groups of professional practitioners, see Section 2.4.

Another measure is to offer the partners relevant lectures at their seminars and conferences. Rather than developing and promoting new media and events dedicated for the project, the project connects with existing media and events arranged by local partners. The result of this work is documented in D7.3 Formation of network partnerships at www.ribuild.eu/knowledge-base.

Appendix 1 gives an overview of the network partners as they were presented at the first version of the RIBuild website.

2.5.4 Production and distribution of a number (>5) of information kits on basis of the project's results (D7.4)

The project delivered knowledge to these networks of communication partners, who – on their side – could benefit from communicating useful results to their audiences. One of the measures for this is the production and distribution of information kits including text, illustrations, fact sheets and instructive videos as described in (RIBuild deliverable D7.4-6-7-10, 2020). Flyers and posters were produced during the project (see Figure 4). A number of videos, e.g. about the risks and benefits of internal insulation were produced in the last year of the project, when the results were known. The first one is seen at Figure 4, all the videos are available at the redesigned website www.ribuild.eu and the RIBuild [YouTube channel](#). The videos are prepared with speak in English and with subtitles in languages of the partner countries.

At the closure of the project, the information kit consists of the redesigned website www.ribuild.eu, accessible from a pc or a mobile phone, focusing on presenting the RIBuild guidelines, and an information folder located at www.ribuild.eu/knowledge-base (presented in (RIBuild Deliverable D7.4.6.7.010, 2020)). Future promotion of results from RIBuild (cf. Section 3.4) will refer to www.ribuild.eu.

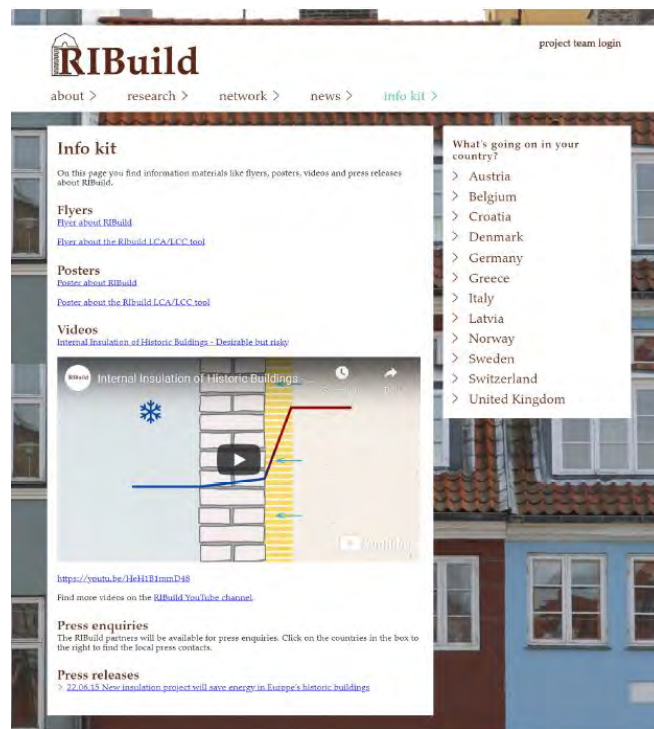


Figure 4: Info kit from RIBuild. Screen dump from original version of www.ribuild.eu, active during the project lifetime (2015-2020)

2.5.5 A workshop/seminar at the beginning of the project (D7.5)

A seminar was held after the first year of the project. At the seminar the project was presented and the expected implications were discussed. After the seminar a survey was conducted in order to gain knowledge about the practitioner's experiences with internal thermal insulation. The conference and the survey are documented in [D7.5 Report on first open seminar](#) and [Survey among practitioners at \[www.ribuild.eu/knowledge-base\]\(http://www.ribuild.eu/knowledge-base\)](#).

The survey shows a need for knowledge about thermal internal insulation and how to handle the biggest challenge which concerns vapour barriers and humidity. The results of the survey was used as input in the development of new guidelines on how to install internal thermal insulation in historic buildings while maintaining their architectural and cultural heritage.

2.5.6 Local seminars at the end of the project (D7.6)

Originally, it was planned to arrange a conference at the end of the project. However, based on experience of the seminar held in Denmark in 2016 (D7.5) and feedback from EU, it was decided – and approved by EU – instead to take part in a number of local (national) seminars, fairs, etc. to make it possible to reach a wider audience of especially building professionals in partner countries, at these seldom participate in international conferences. Events were to be identified in at least three partner countries. The original idea of linking to existing events was kept, as these were already known by the target audience. Based on suggestions from RIBuild partners on possible events, it was decided which of these would be possible to take part in to ensure to be present in at least three countries. News about these events were published at the original RIBuild website, to attract an audience among those following RIBuild, see example at Figure 5.

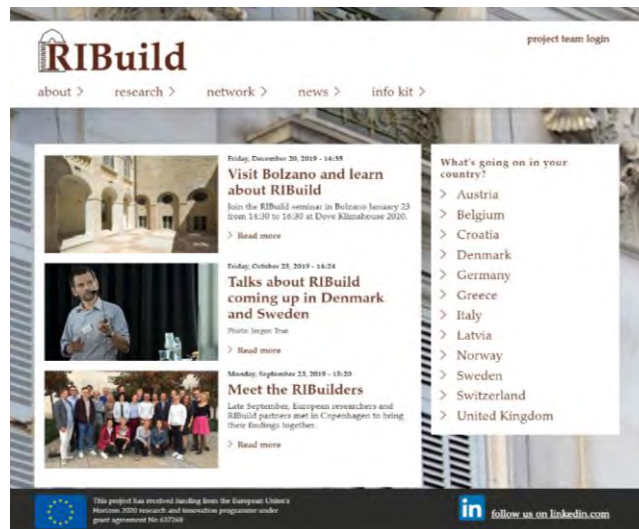


Figure 5: Examples of announcements about local events where the RIBuild project and results were presented. Screen dump from original version of www.ribuild.eu, active during the project lifetime (2015-2020)

Details about the events are documented in (RIBuild Deliverable D7.4-6-7-10, 2020) available at www.ribuild.eu/knowledge-base. This includes events taking place after the project period.

2.5.7 A number (>20) of journal and conference papers (D7.7)

The project was expected to result in a large amount of new knowledge of interest to at least four different groups of the international academic community:

- Researchers interested in building physics
- Researchers interested in architecture of historic buildings
- Researchers interested in planning and energy consumption
- Researcher interested in sustainability.

Results of the project was spread among all four groups by publishing in scientific journals, see Section 2.4. RIBuild kept track of the journals and conference papers at the RIBuild SharePoint site. An overview of published papers etc. is available at www.ribuild.eu/knowledge-base ('Publication base') and in (RIBuild Deliverable D7.4-6-7-10, 2020). At the closing of RIBuild, about 80 papers etc. are published and at the end of 2020 the number will have increased to almost 90.

2.5.8 A project website with templates for reporting, project descriptions, press material etc. (D7.8)

For the purpose of external as well as internal communication of the progression of the total project, RIBuild has established a project website, continuously updated with actual status of the ongoing research projects and their communication. The external website is visible to the public and is used for communication with the network of communication partners (Figure 6, Figure 7).

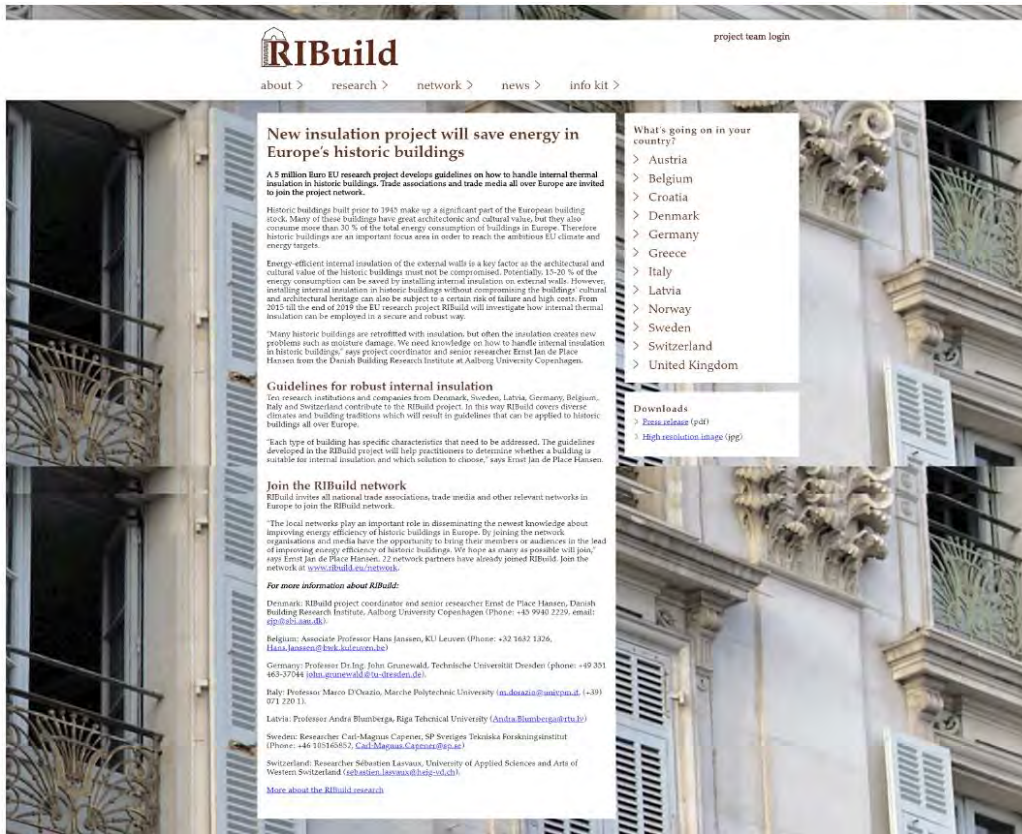


Figure 6: Short description of RIBuild with an invitation to join the RIBuild network. Screen dump from original version of www.ribuild.eu, active during the project lifetime (2015-2020)

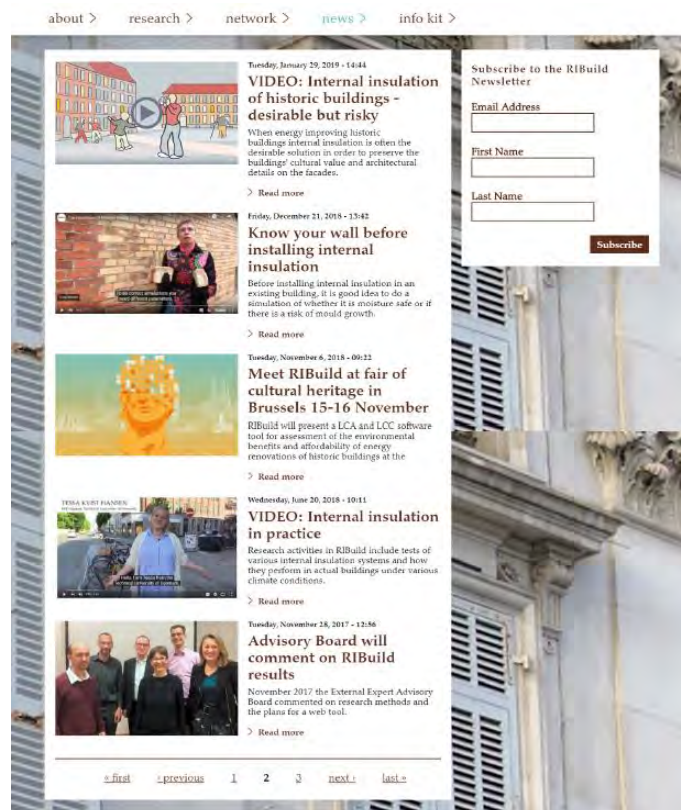


Figure 7: Examples of communication from the RIBuild project. Screen dump from original version of www.ribuild.eu, active during the project lifetime (2015-2020)

The internal website is only visible to the project partners and is a SharePoint site for internal communication among the researchers of the project. The SharePoint site contains templates for reporting etc., project descriptions, press material etc. The SharePoint site supports the cooperation between the project partners. It is possible to work together on reports and papers in a workspace based on Microsoft SharePoint.

See D7.8 Project website at www.ribuild.eu/knowledge-base.

2.5.9 Press releases on the project (D7.9, D7.10)

As part of the general project communication at least two press releases were planned to be issued: One about the start of the research project and another about the conclusive results. The press releases were possible to adjust for national distribution. See the first press release in D7.9 First press release of the project. See the final press release at <https://via.ritzau.dk/pressemeddelelse/new-findings-on-how-to-save-energy-in-europes-historic-buildings?publisherId=8155951&releaseId=13596603>.

Details about the distribution of the final press release can be found in (RIBuild Deliverable D7.4-6-7-10, 2020) at www.ribuild.eu/knowledge-base.

2.5.10 A draft of a communication and exploitation plan (D7.11)

Dissemination and communication has been an ongoing activity in the RIBuild project. Therefore the communication plan will address this process. The exploitation plan will address how and for what purpose the key exploitable results of the project will be used by the target group of the RIBuild project.

D7.11 is a draft version of the communication and exploitation plan for RIBuild. A final version will be produced at the end of the RIBuild project (D7.12).

2.5.11 A final communication and exploitation plan (D7.12)

In the present deliverable, the final communication plan addresses the distribution and use of the information kit and press releases developed in WP7 (Section 2.5.4 and 2.5.9), and the exploitation plan addresses how and for what purpose the key exploitable results of the project is expected to be used by the target groups of the RIBuild project.

2.6 Schedule for deliverables

Table 3: Schedule for deliverables in WP7

Deliverable	Activity and lead partner	Time [Month: M]²
D7.1	Procedure for evaluating research results in terms of relevance to practice (AAU)	M6
D7.2	Map of Member States' relevant professional networks (AAU)	M6
D7.3	Formation of network partnerships (AAU)	M6
D7.4	Production and distribution of a number (>5) of information kits on basis of the project's results (AAU)	M66
D7.5	At least one workshop/seminar at the beginning and one conference at the end of the project (AAU)	M12, M66
D7.6	A number (>20) of journal and conference papers (all)	M66
D7.7	A project website with templates for reporting, project descriptions, press material etc. (AAU)	M3
D7.9	A press release in the beginning of the project (AAU)	M6
D7.10	A press release at the end of the project (AAU)	M66
D7.11	A draft of a communication and exploitation plan (AAU)	M36
D7.12	A final communication and exploitation plan (AAU)	M66

2.7 Resources

Person months (WP7, AAU): 19

Website, seminars etc., external costs: EUR 40.000

The other partners each have 3 person months for WP7 activities. These months are not included in the budget in Section 2.8.

Further, the RIBuild budget includes external costs for publishing: EUR 30.000, distributed on RIBuild scientific partners from EU member states (excluding HES-SO, IFLEX and ERIK).

² M1 = January 2015

2.8 Budget

Table 4: Budget for WP7, AAU

Deliverable	Activity	Person months (AAU)	External cost [EUR]
D7.1	Procedure for evaluating research results in terms of relevance to practice (AAU)	2	
D7.2	Map of Member States' relevant professional networks (AAU)	2	
D7.3	Formation of network partnerships (AAU)	2	
D7.4	Production and distribution of a number (>5) of information kits on basis of the project's results (AAU)	3	
D7.5	A workshop/seminar at the beginning and one conference at the end of the project (AAU)	1,5	10.000
D7.6	A conference at the end of the project (AAU)	1,5	10.000
D7.7	A number (>20) of journal and conference papers (all RIBuild partners)	1,5	30.000
D7.7	A project website with templates for reporting, project descriptions, press material etc. (AAU)	3	20.000
D7.8	At least two press releases on the project (AAU)	0,5	
D7.11	A draft of a communication and exploitation plan (AAU)	1	
D7.12	A final communication and exploitation plan (AAU)	1	

3 Exploitation plan – final

3.1 Background and objectives

The draft version of the Exploitation Plan, included in (RIBuild Deliverable D7.11, 2017) was based on the considerations and outcome of an Exploitation Strategy Seminar (ESS) held in Leuven 17 November 2017. The ESS was a brainstorming exercise to characterize the Key Exploitable results (KERs), discuss key features and the risks and obstacles for using them.

The ESS focused on one KER: The web tool developed in WP6. The reason for this decision was that the partners assessed the web tool as the most relevant result for the practitioners together with the guidelines. Further details about the ESS are documented in (RIBuild Deliverable D7.11, 2017).

At the time when the ESS was held, it was not concluded whether it was possible to develop a web tool; a feasibility study to explore this was ongoing. In parallel with carrying out the feasibility study – and in the end setting up a user interface for the web tool, limiting the user interaction to rather few input about the actual building – it was investigated who would be interested in hosting and developing the tool, if RIBuild managed to present a tool at end of the project.

Coming close to the closing date of RIBuild, it was realised that although a first version of the web tool was available, it was still to be regarded as a beta-version, not sufficiently comprehensive and reliable to be used as a stand-alone support tool when deciding whether a specific insulation system and a specific thickness would be recommended. Therefore, it was not regarded realistic to finance the future development by payment from manufacturers, and letting an external partner host the web tool and the website, as originally scheduled (RIBuild Deliverable D7.11, 2017).

In short, the web tool suffers from not being based on a sufficiently number of simulations of the hygrothermal performance and also from not covering all relevant failure modes, as not in all cases reliable models are available in 2020. The web tool and its limitations are further described in (RIBuild Deliverable D6.1, 2020).

3.2 Characterization of the web tool

The web tool will help practitioners choose the best solution for their internal insulation project. Figure 8 describes the web tool data flow.

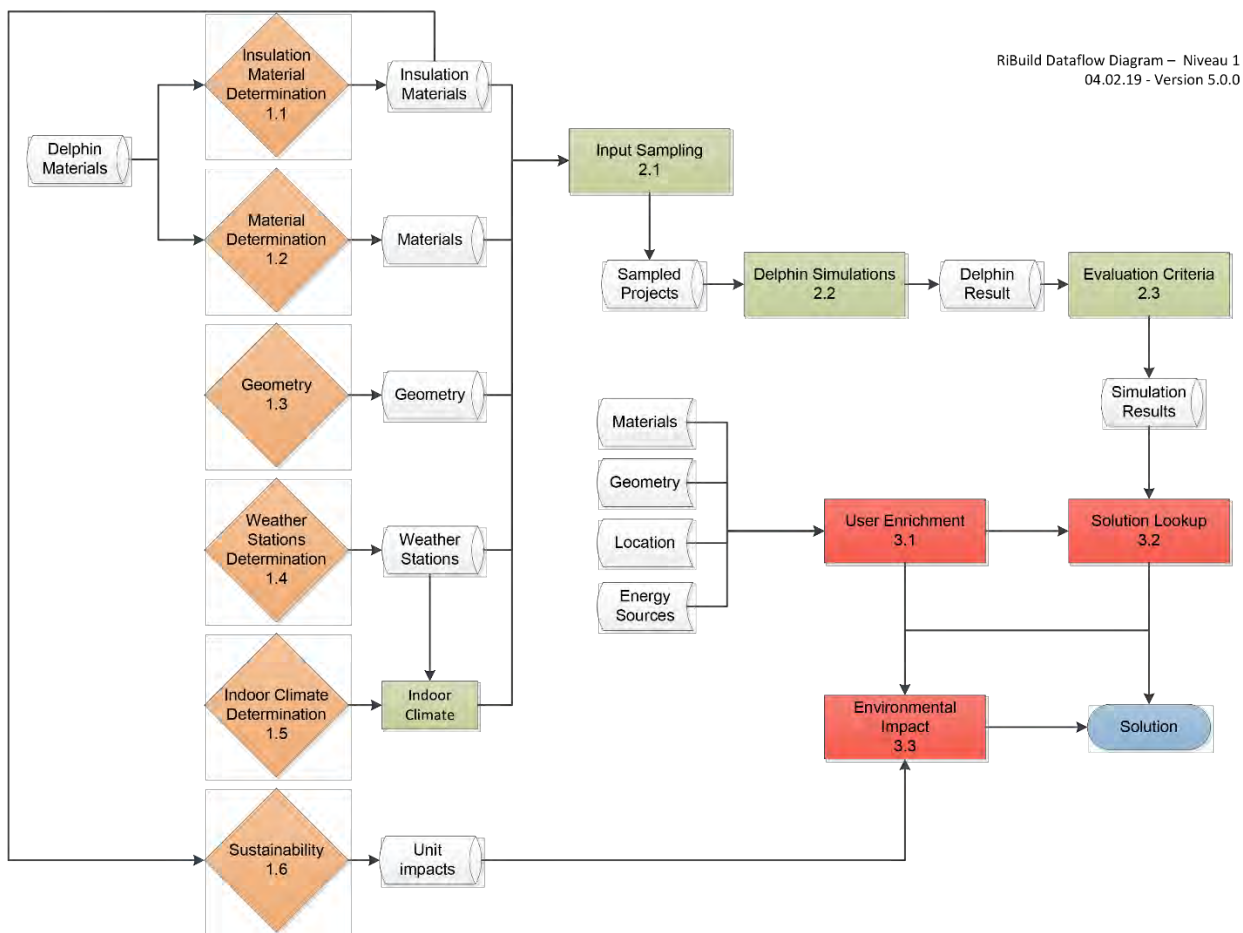


Figure 8: Data flow in the Insulation Calculator web tool (ICT) (version from Feb 2019), including databases (orange squares), sampling and simulations operations (green rectangles) and user enrichment (red rectangles), leading to solutions (lower right corner). The Environmental Impact part was excluded in the final version of ICT.

Table 6 describes the web tool as a KER, based on the outcome of the ESS and updates made afterwards based on the version of web tool present at the closure of RIBuild.

Table 6. Characterization of the web tool as a KER

<p>Description of the KER</p>	<p>Based on a few input from the user about location and orientation of the building and about the wall material, the web tool presents a list of applicable internal insulation systems. For each of these, the web tool gives a thickness, the U-value of the solution, the interior surface temperature, the heat loss, and the Mould Index and Algae index related to the specific solution.</p> <p>The tool is based on numerous pre-calculated cases of internally insulated solid walls, made in the DELPHIN simulation tool, using combinations of wall thicknesses, historic building materials and insulation systems developed for internal insulation. The solutions cover common types of external walls in historic buildings and insulation systems present in the partner countries.</p> <p>The web tool can support decision-making by presenting the interior surface temperature, the Mould Index and the Algae Index for the different solutions, indicating the risk of internal insulation in the specific case. Also the U-value and the heat loss is important for the decision making.</p>
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Problems you are addressing and how your customers solve them so far	<p>Today customers are reluctant to use internal insulation because of the related risks (increased risk of moisture related damage) and lack of best-practice examples.</p> <p>Simulation tools are too time-consuming to be relevant when deciding whether or not to apply internal insulation. The web tool will give a quick estimation of applicable internal insulation solutions and relevant thickness of these, combined with information about interior surface temperature, Mould Index and Algae Index, indicating the risk associated with the solution.</p> <p>Implementation of internal insulation solutions is hindered by the lack of an overview of benefits and risks of such solutions. Also the perceived complexity of internal insulation solutions is a barrier: different fields of knowledge involved, a lot of time to collect and evaluate available information, not well disseminated best practices.</p> <p>The web tool provides a holistic approach to the issue, both for the practitioners and in the education of students.</p>
Unique Selling Point	<p>This KER brings together knowledge on material properties and weather data from all over Europe, with advanced methodologies for simulating hygrothermal performance and LCA/LCC of the chosen solution.</p>
Product/Service Market Size	<p>Use of the web tool will be free. 3.000 users a year is expected (web hits using the web tool)³.</p>
Market Trends/Public Acceptance	<p>The society wants to reduce heat loss and CO₂ emission. To achieve this internal insulation is often the only solution when external insulation is not possible.</p> <p>There is a need for better understanding of benefits and risks of internal insulation. And ways to determine if a building is suitable for internal insulation.</p>
Product/Service Positioning	<p>The web tool can be used by a non-professional building owner who does not necessarily have any pre-existing knowledge about internal insulation but who is interested and able to investigate the building renovation options if the information available is not too technical.</p> <p>The building owner/consultant need, as part of the decision-making process, a quick estimate of the possibilities.</p>
Legal or normative or ethical requirements (need for authorisations, compliance to standards, norms, etc.)	<p>The web tool complies with relevant standards. The developers of the web tool are not legally responsible for decisions taken on the basis of the web tool outcomes; liability disclaimer in each country has been considered.</p> <p>Regulations concerning the preservation of historic buildings in the different countries must be taken into account by the user.</p> <p>In the future, incentives for renovation improving energy performance could be included in the web tool.</p>
Competitors/Incumbents	<p>Competitors could be those offering alternative solutions, but apparently there are no competitors, i.e. this KER will create the market.</p>

³ This number was based on having a fully developed web tool at the end of the project, which is not the case. The number has not been updated.

Early Adopters - First Customers	Building consultants, architects and engineers, minor companies not having the budget for sophisticated and complex tools can be early adopters.
Cost of implementation - bringing product/service to the “market” (before Exploitation)	Cost of implementation will cover testing the system, quality control and contacts with the manufacturers and users. The web tool should be freely available for the users, and the expenses should in time be covered by manufacturers of insulation systems suited for internal insulation delivering data to the web tool.
Time to market (from the end of the project)	After completing the beta version it has to be tested in a number of cases before being ready for the market. The tool might be ready for market one or two years after the RIBuild project has ended, given the level of acceptance of the targeted groups.
Foreseen Product/Service Price	It should be free to use the web tool. However, depending on succeeding in making the web tool full functioning, the manufacturers of internal insulation will have to pay a fee to keep the web tool running. The fee should vary according to the number of contributing companies.
Adequateness of Consortium Staff	A few people with the right skills are sufficient. The Consortium Staff should be able to keep the web tool updated with new product data in order to function as described in this characterization scheme, to keep in contact with producers and users, and to manage the web tool. The consortium staff is not expected to improve the system because that will imply more research.
External Experts/Partners to be involved	External Experts/Partners could test the beta version making further recommendations for improvement.
Status of IPR: Background (type and partner owner)	Eventual data from manufacturers uploaded to the web tool should be protected.
Status of IPR: Results/Foreground (type and partner owner)	Based on the WP6 description as prepared for the H2020 application, DTU initiated the idea of a database and a web tool in January 2016, approved by all partners June 2016. No claims on the web tool.
Status of IPR: use the results from the Exploitation Form	Until a cooperation agreement between AAU, ERIK, DTU and UNIVPM concerning hosting the website and the uploaded tools developed as part of RIBuild exists, there are no specific plans to involve manufacturers, as the web tool is not regarded as advanced enough to be of their interest. Also no product names are shown at the website, as this is a condition for AAU to become a host. However, at a later stage the hosts might consider to contact manufacturers of products not being represented, acknowledging the present limitations of the web tool (Section 3.1).
Partner/s involved expectations	The web tool could be used for professional and educational purposes. It could raise awareness of the problem and pave the road for more and definitely better renovation.
Sources of financing foreseen after the end of the project	Due to the present stage of the web tool (beta version), no sources of financing are expected from manufacturers of internal insulation solutions, for minimum one or two years. An ongoing national Danish project on internal insulation, involving the Danish RIBuild partners, might cover the expenses the first year for hosting the web tool and website while making these products known. If and when the web tool becomes more comprehensive, manufacturers might be interested in having their products included in the web tool database, for which they will have to pay a fee. The resources will cover managing, presenting and updating the web tool. If a manufacturer has not tested the hygrothermal properties of an

	<p>insulation solution or if the solution has been improved, the manufacturer will have to pay for testing the insulation solution at a research institute.</p> <p>Eventually, further funding is needed for improving the web tool and the database that the tool is dependent on.</p> <p>With more research and a database with more simulations, more accurate described solutions for internal insulation of a building will be available for the users. If building owners agree to an investigation of the real hygrothermal performance of the installed solution in their building, the web tool can be improved and deliver more precise assessments. Or it could even be a requirement in national building regulations to monitor the building after renovation. Either as a stand-alone requirement or as a requirement to get public funding for the renovation.</p>
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3.3 How to exploit the web tool

3.3.1 Exploitation roadmap

The road to implementing the web tool is described in Table 7. The timing is indicative, still to be settled between the partners involved in the future cooperation.

Table 7: Exploitation Roadmap (Actions to implement after the expiration of the EU grant)

Briefly describe actions planned 6 months after project end	Preparing cooperation agreements between AAU (main host), ERIK (co-partner), DTU (developer of web tool) and UNIVPM (developer of LCA/LCC tool)
Roles for partner involved	AAU will prepare a draft for a cooperation agreement. The other partners is expected to contribute with ideas and comments.
List milestones and monitoring parameters	<p>Milestones and monitoring parameters:</p> <ul style="list-style-type: none"> • Six months after completing RIBuild: A draft for a cooperation agreement is ready • 1-1½ year after completing RIBuild: How much interest did the beta-version attract? A list of all needed actions and resources required for maintaining and updating the web tool. Financing of the update is identified. • 2½-3 years after completing RIBuild: The business plan will be re-evaluated. Will the web tool be interesting for additional manufacturers to be part of? Are progress made on models of failure in the research environment? Can the aggregation of simulations be improved?
What will be next? (what is planned after 2½ years?)	<p>AAU is managing the web tool and the website together with ERIK. The users have free access to a web tool being developed to become full functioning. A fee paid by the manufactures of insulation material might be introduced. The fee will cover listing the material, marketing and web updates.</p> <p>The business model will be re-evaluated.</p>
What will be the impact in 3-5 years' time? (jobs created, investments mobilized, turnover generated)	9.000 hits using the tool ⁴

⁴ This number was based on having a fully developed web tool at the end of the project, which is not the case. The number has not been updated.

3.3.2 How to cover the cost of exploitation after the project has ended

The costs of the exploitation after the project has ended is listed in table 8.

Table 8: Cost after the end of the project and how to cover them.

Budget to implement planned activities (3 months, 6 months, 1 year).	3-6 PM's per year
Financial sources to cover budget	Not yet found, however an ongoing national Danish project on internal insulation might cover the expenses the first year (fees for websites etc.). Funding for future activities are to be identified as the first step of a cooperation between AAU, DTU, ERIK and UNIVPM.
Timeline for the funding	2-3 years
Projected revenues and eventual profits over the next 3-5 years?	No profits

3.4 The partners' contribution (ground identification)

Table 9 describes the RIBuild partners' contribution to the development and exploitation of web tool, their willingness to claim rights and bring the web tool to the market after the end of the RIBuild project. Table 10 gives a status on the agreement to transfer the exploitation right to an external partner. Both Table 9 and 10 is based on the table about 'ground identification' provided by Sara Giordani from TTP Lab who was appointed as ESS expert by EU (RIBuild Deliverable D7.11, 2017).

In the original table, all project partners are supposed to be listed in a matrix in order to show the different contributions and commitment from the partners. We have simplified the table. Instead of listing all project partners in a matrix, we have mentioned the relevant project partners in the right column in Table 9. This makes it possible to explain the nature of the partner's contribution and commitment. Also, we have mentioned the possibility of involving external partners in the future.

Table 9: The partners' contribution

Partners willing to go to the market	AAU is willing – together with ERIK – to manage the web tool and the website when RIBuild is finished. At a later stage, an external partner that will and is capable to manage the web tool might be considered, depending on the prospects and the interest for the beta-version. An external partner should be free of interests related to specific products on the market as the database included in the web tool covers products from several manufacturers. Therefore the external partner cannot be a producer of internal insulation. It could be a university or a trade organization.
Porte-parole partner (not contributing)	None. All RIBuild partners are contributing to the development of the web tool because it is developed in WP6 based on results from WP1-5.
Partners providing background knowledge and their willingness to claim rights	All RIBuild partners are supplying background knowledge to the project and development of the web tool. TU Dresden has the rights to the simulation tool (Delphin) used for simulating the hygrothermal performance of the internal insulation cases the web tool is based on. The partners claim rights to their research knowledge used within the RIBuild project.
Partners providing results and their willingness to claim rights	All partners are contributing to the results that the web tool is based on. The partners claim rights to and are responsible for the research results. The partners do not claim rights to the web tool. This is transferred to the internal or external partner that will manage the web tool after the RIBuild project has ended.
Nature of the partners' foreseen activities	RIBuild research partners produce research that can be used for developing the web tool. They develop the web tool in collaboration with RIBuild partner ERIK, an architectural company. Communication professionals at AAU disseminate the RIBuild results in collaboration with the researchers.
Rights and obligations that are given to the internal or external partner that is willing to manage the web tool	The web tool manager will be given the rights to the interface of the web tool, the database behind it and the opportunity to update the database using the DELPHIN simulation tool. Rights to the simulation tool as such, including further development of this stays at TUD. Further, the manager will have the obligation to keep the web tool running, to keep the database updated and to promote the web tool among relevant professional practitioners.

Table 10: Status on agreement to transfer the exploitation right to external partners

All RIBuild partners agree to transfer the exploitation rights to a business team	
There is still room to clarify the IP/IPR	X
At least one partner do not agree to transfer the rights (VETO)	

It is the aim to further develop and update the website to let it become a European portal for internal insulation of historic buildings, i.e. keeping it updated with research within this field, also motivating external universities, manufacturers, organisations, etc. to let their knowledge become part of the website. And to improve the Insulation Calculator Tool, at present available in a beta-version at www.ribuild.eu.

AAU is prepared to host the web tool after the RIBuild project has ended, in cooperation with ERIK. No partners had objections to this. The preparation of a collaborative agreement to handle this is ongoing in autumn/winter 2020/2021, including AAU (RIBuild project coordinator), ERIK (host of www.ribuild.eu), UNIVPM (developer of LCA/LCC tool) and DTU (developer of WP6 web tool). In the first phase, the partners will specify what is needed to fulfil the aim and apply for funding to carry out the further development in the second phase. The collaboration is expected to continue for a couple of years.

Ideas for developing the website, provided additional funding are identified:

- Update the guidelines and web site with new knowledge on the items covered at present
- Update with knowledge with fields at present not covered (e.g. impregnation)
- Update the list of case buildings and the recommendations based on these
- Update the web tool with more simulations (locations, orientations, insulation systems ...)
- Develop network, including universities etc. that are active within this field (research projects, student projects ...)
- Link to other relevant websites, international or national/local

The development of the website is to be accompanied by additional promotion towards the building professionals of the outcome from RIBuild.

3.5 Risk assessment

In the draft version (RIBuild Deliverable D7.11, 2017), it was concluded, that the financial and managerial risk is high due to the possibility of weak exploitation of the material and difficulties in identifying economic actors willing to maintain the database. The risk will be controlled through market research, revision of exploitation plan and dissemination to the most promising audience. All the other risks are low and will therefore be monitored, but not handled with specific actions.

This is not re-evaluated, as the web tool is not fully developed. As a first step, a couple of RIBuild partners are willing to host the web tool for a period, while considering the resources etc. needed to make the web tool fully operative and attractive for the market, as described in Section 3.4.

4 References

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Appendix 1 Network partners

The screen dump in this appendix shows the network or communication partners registered per May 2020 (the first version of the www.ribuild.eu website).

