Identifying Sociocultural Values of Environmental Sustainability within Architectural Heritage:
How Users Value Heritage Listed Buildings and the Prospect of Energy-Efficiency Interventions?

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University of Groningen. August 2015.

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Second Reader:
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Image on cover:
Church of Nieuw Scheemda in the 80’s (source: Media Library of the Stichting Oude Groninger Kerken, Nieuw Scheemda folder 1)
Dedications.

To my father, who taught me to appreciate and love architecture.

To my mother and my brother for their constant love and support.
Foreword.

I have been a university student for thirteen years; from 2002 until 2015. First I was enrolled at the law school in the National University of Mexico; then I finished my four-years grade in History at the Instituto Cultural Helénico in Mexico City; then I studied a long course on Art History at the Universidad Iberoamericana; then I studied History of South-Eastern Europe at the Babes-Bolyai University of Cluj-Napoca in Romania, together with a 6 months exchange in the University of Graz, where I centred my studies in globalization, international politics and history. Today, at the end of this long process of studies I am finishing a Master in History of Architecture and Town Planning at the University of Groningen. My elongated study process may appear as an undecided career path, but I am convinced that all the exams I have presented, the many professors I have learned from, the books I have read, the subjects I have approved; all have taken me to this precise point, where I finally found a research area that can condense all the disciplines that I have been in contact with: Architectural Heritage.

The decision to research on a subject related to Architectural Heritage comes from a six months long process of reading and reflexing on my wishes, knowledge, passions and availability of sources. In Architectural Heritage I have found a place to overlap history, art, politics, heritage management and architecture, with a research approach from the empirical and anthropological analysis and documental research. In addition to this mixture of disciplines, Architectural Heritage gives me the chance to include my interest for indulging on themes of environmental conservation, resources management and sustainability. The result is this thesis, a humanist view and study of a mixture of technical, scientific and socio-cultural elements.

Another important element that originated this thesis was a gift. During my studies in Groningen I received from professor Theo Spek a book, entitled *Energy Efficiency Solutions for Historic Buildings. A Handbook*, the reading of which derived in realizing that architectural conservation could be approximated from a variety of humanist disciplines to give a biggest development to notions discovered by technological specialists, but that are limited to technical applications and somewhat disconnected from the social and cultural realities. I saw a lack of consideration to the societal view of architectural conservation and energy efficiency
interventions; therefore I decided that it would be a good thing to enquire about, thus I had my research subject.
Acknowledgments.

I want to thank first and foremost to my family for their constant support, both moral and economical, especially to my parents Ezequiel Colmenero Búzali and my mother Silvia Acevedo Jiménez, but also to my brother Jorge Octavio Colmenero. I thank them for their sacrifice that allowed me to keep studying abroad for the last few years.

Special thanks to the “Consejo Nacional de Ciencia y Tecnología (CONACYT)” for awarding me with the scholarship that financed most of the tuition fee and my expenses during the “Master in History of Architecture and Town Planning”. Also to the “Netherlands Education Support Office (Nuffic Nesö México)” for awarding me the complementary “Orange Tulip Scholarship” for the same degree. Without both scholarships I couldn’t have studied and lived in Groningen.

To my supervisors prof. Kees van der Ploeg, dr. Maarten Vieveen and dr. Tineke van der Schoor for guiding me and supporting me during the development of this thesis. Also to prof. Theo Spek, who helped me when I needed it most and who presented me with the book that initially inspired this research.

To drs. Marijke Dam, Confidential Advisor of the University of Groningen, for the support and opportune help when I was suffering a shocking personal and professional crisis during my studies in Groningen.

To the University of Groningen for accepting me and for being such an excellent institution for education and professional development, full of modern and accessible resources, exceptional personnel and outstanding facilities.

To the “Stichting Oude Groninger Kerken” for opening me its doors, resources and facilities. Special thanks to Stieneke Wierda from the multimedia library for her great help obtaining the pictures and resources that I needed.

And finally to the key-informants and villagers interviewed during the development of this research, and who are the main subject of this thesis.

Ezequiel Colmenero Acevedo.

Haren, Groningen.

10 August 2015.
# Table of Contents

Dedications. ................................................................. v  
Foreword.............................................................. vi  
Acknowledgments. .............................................................. viii  
Introduction: ................................................................................................. 1  
Topic ................................................................................................................... 1  
Justification. ................................................................................................. 1  
Questions. ................................................................................................. 3  
Hypothesis. ............................................................................................... 3  
Methodology .............................................................................................. 4  
Organization of Chapters. ................................................................. 5  

**Chapter 1. Historical Buildings and Conservation.** ............................................ 6  
1.1 Architectural Heritage Conservation. ................................................................ 6  
1.2 Architectural Heritage Values. ................................................................. 9  
   1.2.1 What are “Values” in Heritage Studies? ............................................. 9  
   1.2.2 Typologies of Values. ....................................................................... 13  
   1.2.3 Sociocultural values. ......................................................................... 16  
1.3 Assessments of Significance ......................................................................... 18  
   1.3.1 Assessment of Significance: the Use of Values. .................................. 18  
   1.3.2 The Statement of Significance. ............................................................. 22  

**Chapter 2. Adaptive Reuse, Energy Efficiency, and Sustainability.** ................. 24  
2.1 Principles of Sustainability in Architectural Conservation. .......................... 24  
2.2 Adaptive Reuse of Heritage Buildings. ....................................................... 29  
2.3 Energy-Efficiency Interventions. ................................................................. 32  
2.4 Thermal Comfort. ...................................................................................... 40  

**Chapter 3. Research on Sociocultural Values on Energy Efficiency Interventions.** 42  
3.1 Existing Research Models. ........................................................................... 42  
3.2 Proposed Approach. .................................................................................. 47  
3.3 Interview and Questionnaire Structure. ....................................................... 51  

**Chapter 4. Results and Analysis.** .................................................................... 55  
4.1 Nieuw Scheemda church. ............................................................................ 56  
4.2 Leegkerk church. ....................................................................................... 61  
4.3 Lettelbert church. ...................................................................................... 66  
4.4 Obergum church. ...................................................................................... 70  
4.5 General analysis. ...................................................................................... 74  

**Conclusions and Recommendations.** ......................................................... 75  
Limitations and opportunities. ......................................................................... 78  
Recommendations for sustainability. .................................................................. 78  
Considerations for future research. ................................................................. 79  

**List of Sources.** ............................................................................................... 81  
**Appendix 1. Tables.** ...................................................................................... 85  
**Appendix 2. Figures.** ...................................................................................... 87  
**Appendix 3. Interview sheet and preparatory questionnaire.** ......................... 117
List of Tables.

Table 1. Relevant Typologies of Values ................................................................. 85
Table 2. Sociocultural values and economic values ............................................. 86

List of Figures.

Figure 1. Window shutters .................................................................................. 87
Figure 2. External secondary glazing ................................................................. 88
Figure 3. Sectioned internal glazing ................................................................. 89
Figure 4. Sliding internal glazing installation ................................................... 90
Figure 5. Internal insulation layers ................................................................. 91
Figure 6. External insulation detail ................................................................. 92
Figure 7. Glass internal lobby ......................................................................... 93
Figure 8. Floor heating layers ........................................................................ 94
Figure 9. Wall radiant heating system ............................................................... 95
Figure 10. Photovoltaic cells .......................................................................... 96
Figure 11. Photovoltaic cells in panel on a roof ............................................. 97
Figure 12. Discrete photovoltaic cells on a roof ............................................. 98
Figure 13. Nieuw Scheemda Church ............................................................... 99
Figure 14. Nieuw Scheemda, interior ............................................................... 100
Figure 15. Nieuw Scheemda, interior, before 1960 ........................................ 101
Figure 16. Nieuw Scheemda, interior, after 1960 ........................................... 102
Figure 17. Heated pipework of the wet system in Nieuw Scheemda church ...... 103
Figure 18. Nieuw Scheemda lobby and wet heater ......................................... 104
Figure 19. Wet convector under a window, Nieuw Scheemda ....................... 105
Figure 20. Leegkerk North wall ................................................................... 106
Figure 21. Leegker, interior during an event ................................................... 107
Figure 22. Leegker interior from the apse ......................................................... 108
Figure 23. Lettelbert church ....................................................................... 109
Figure 25. Lettelbert, interior from the choir gallery ..................................... 111
Figure 26. Lettelbert, kitchen transformed in classroom .................................. 112
Figure 27. Obergum church, 1940’s ................................................................. 113
Figure 28. Obergum church before the 1969 renovation ................................ 114
Figure 29. Leegkerk church interior before renovation .................................... 115
Figure 30. Obergum church interior to the apse .............................................. 116
Introduction:

Topic.
This study intends to propose a research approach to enquire on the sociocultural values and user attitudes towards heritage listed buildings and the possibility of intervening them to improve their energy efficiency and thermal comfort. Additionally this research tries to find elements of the user attitude when confronts architectural and historical value against values of sustainability. Four heritage-listed churches in the province of Groningen, the Netherlands were selected. A small group of users or keepers was selected for each church as informants. Each group answered an individual structured interview in which they were asked about thermal comfort, heritage attitudes and energy efficiency interventions in their specific church. Through the analysis of their responses, the research questions that this thesis seeks to answer are: How users value heritage listed buildings and the prospect of energy-efficiency interventions on them? Would be convenient to include their non-professional valuation into an assessment of significance prior to an intervention for energy-efficiency? And, would an anthropological research on sustainability improve the understanding of the sociocultural values on architectural heritage?

This research fits into the area of theoretical architectural conservation. It describes the main points considered in value-based approaches for assessing listed buildings and tries to link user specific values of sustainability to the historical, architectural and cultural significance of the edifications to find discerning points an opinions between specialists and non specialists.

Justification.
This research may help as guiding decision-making in the conservation process by providing a documented research on the community that owns, uses or supports the listed buildings. The research could convince about the relevance of the church itself and the importance and added value that the possible improvements could carry, both in heritage, comfort and sustainability. It will propose ways to assess socio-cultural
values including technical elements, thus closing a gap between practice and theory and making interdisciplinary propositions.

The research could also help to convince about the compatibility between heritage buildings and sustainability in architecture and influence on heritage owners and community stakeholders \(^1\) (heritage conservation societies, foundations, local committees and investors) to subject their properties to procedures formerly considered as value detriment. It could also give understanding on how much the theory is separated from the reality on the discourse of thermal comfort perceptions and people’s attitudes towards energy-efficiency interventions. Finally it could help in the decision-making process as part of a pre-intervention analysis for energy-efficiency. “The driving question for energy-efficiency projects should be not only ‘what energy interventions will zero-carbon a heritage building?’, but also ‘what does this building mean for those who ‘use it?’ and ‘what interventions (if any) can be implemented that could co-exist harmoniously with those meanings?’”\(^2\)

Previous research in the area has focused only in one of two aspects of this research. There are a number of studies and established methodologies that help engineers to assess thermal comfort by interviewing users and also to define needs for energy-efficiency interventions by the means of thermal and structural calculations, both cases are essentially technical and do not look for the personal opinion of the user, only his appreciation of thermal comfort. The other kind of existing research focuses on anthropological studies on society’s opinion and attitudes towards conservation and heritage; such studies do not consider interventions on energy efficiency and sustainability and limit themselves to the people’s opinion on standing built heritage. Kalliopi Fouseki and May Cassar have remarked, “Studies of occupants attitudes and behavior with regard to energy-efficiency interventions are critical.”\(^3\) My approach intends to research user attitudes towards the heritage

\(^1\) Stakeholder: “a person or company that is involved in a particular organization, project, system, etc., especially because they have invested money in it.” A. S. Hornby, in *Oxford Advanced Learner’s Dictionary*, ed. Joanna Turnbull (Oxford: Oxford University Press, 2010).


\(^3\) Ibid.
buildings and interventions for sustainability, all paying special attention to how they use of the building and what they expect of it.

**Questions.**

This research was born in great part by the provocation that May Cassar and Kalliopi Foušek outlined in an editorial for the journal The Historic Environment, in which they presented some research focuses that are needed in the field of conservation:

“Existing research thus far has focused on how people use a heritage building rather than how they view or value it…. Needed new focuses:

- How people value their buildings and the impact of energy-efficiency interventions
- How people feel and behave towards their built environment.”

Following their provocation of research focuses, this research expects to answer the following questions:

- How users value heritage listed buildings and the prospect of energy-efficiency interventions on them?
- To what extent user generated values are being considered for assessments of significance prior to energy efficiency interventions?
- Can user values be identified by ethno-anthropological fieldwork research methods?
- Can energy efficiency interventions be assessed from the user perspective?
- How important are notions of architectural sustainability for heritage building users?

**Hypothesis.**

“The user values related to thermal comfort and energy efficiency in historical buildings can improve the assessments of significance prior to energy-efficiency interventions of architectural conservation and

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4 Ibid., 98.
adaptive reuse and lead to a better decision-making on whether and how historical buildings should be intervened.”

Methodology.
A review of the processes of assessing heritage values and significance on historical buildings is the first part of this study. Afterwards I will present some principles of sustainability in architectural conservation combined with the focus point on assessing values of heritage building. This will lead me to the proposal of the study approach; explaining the use of qualitative methods taken from the ethnological and anthropological methodologies for fieldwork research by the means of a structured interview. Finally I will present an interpretation and comparison of the values and attitudes found on the interviews with the theoretical and professional attitudes on energy-efficiency interventions. A description and evaluation of the interviews results will be accompanied with personal observations and proposals for managing the results.

The first part of the study is informative and the result of a five months long literary research and discrimination of sources. The second part is divided between the presentation of the approach and methodology for analysis and the results of the fieldwork, making the very last part mostly subjective and the result of personal interpretation.

Even when the cases of study are in the Netherlands, the research is not privative of this country and no specific country policies have been included, it is a general theoretical proposal of research approach that can be applied in any territory.

Unfortunately for this study, the fieldwork and writing of the present text had to be made in the time of only seven weeks, in a holidays period, therefore the research is limited to a few buildings and very few informants, this in consequence of the lack of available informants that were on vacations and their return dates were out of my university deadlines for the presentation of this text.
Organization of Chapters.

As already elaborated in the methodology, this study is presented in two parts; Chapters 1 and 2 form the first. These chapters provide the theoretical information and basis for the analysis that will be presented in the second part.

Chapter 3 and 4 are the main body of the research. Chapter 3 is the presentation of the research approach, while Chapter 4 is the presentation of the results of the fieldwork. In this context, the last chapter relates stronger with the first two chapters as it intends to position the information resulted from the fieldwork with the fundaments of the theoretical part. In this context, Chapter 1 and 2 are interconnected, while their relevance is answered in Chapter 4, using Chapter 3 as the methodological link and introduction to the last one.

The decision to give the literary review in the third Chapter obeys to the need of explaining the theoretical fundaments that previous methods and approaches have presented; and also to better link the proposed methodology with the existing research on the subject.

1.1 Architectural Heritage Conservation.

Heritage is a state of the mind: the consciousness of the past. Heritage is the group of physical elements that we inherited from the past. In this context, Architectural Heritage would refer to the buildings that have survived the test of time and are still standing. John Stubbs says “the historic architecture around us enriches human existence and makes our knowledge of the past more comprehensible.” Heritage is the physicality of history, and then heritage buildings are the standing documents of the history of architecture and the past of the human being himself. It is the task of conservation to ensure the continuity of their existence, including structure and special characteristics. Heritage conservation is an activity that deals with the objects from the past, to keep them in the present in order to preserve them for the future.

The professional activity of architectural conservation – also called preservation – is a process in which professionals from different backgrounds interact with the intention to protect the physical characteristics of a building that is considered to be historical. It is not simply a task of architectural maintenance, but a scientific study subject to strict legal regulations and extensive multidisciplinary analysis. In words of Aylin Orbasli, “conservation is the process of understanding, safeguarding and, as necessary, maintaining, repairing, restoring and adapting historic property to preserve its cultural significance.” Over all architectural heritage conservation is a network of professionals that take care of buildings with the intention of preventing its extinction.

The conservation of architecture has been present since the Renaissance, when architects made adaptations, restorations and other interventions to medieval

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7 For United States’ English, preservation is used as a synonym of conservation, being preservation the predominant word in use among academic and specialists in that country
churches and castles. Nonetheless that kind of conservation was greatly far from what the activity became to be in the 20th Century. What we know now as heritage conservation is the result of a large process of debate and theorization by many groups, organizations and individuals that are unable to claim full responsibility for the creation of the discipline, is a shared experience that started at 1931 in Athens, with the First International Congress of Architects and Technicians of Historic Monuments. As the result of such convention the Athens Charter for the Restoration of Historic Monuments was created. The second historical moment for the conformation of the discipline of heritage conservation came with the Second International Congress of Architects and Technicians of Historic Monuments in 1964 in Venice, thus generating the Venice Charter, which gave recognition to the historical, spiritual and artistic elements within historical monuments, not only to the technical and architectural elements.

Until 1972, monumental and architectural conservation was led by conservation societies mostly in Europe, United States and Australia; but that year saw the establishment of the World Heritage Convention by initiative of the UNESCO, with the aim of preserving both environmental and cultural heritage around the globe for future generations, by introducing conservation in global politics. After that, a new step came with the New Orleans Charter for the Joint Conservation of Historic Structures and Artifacts of 1991; which proposed ways to keep the authenticity by minimizing interventions or limiting them to structural and aesthetical maintenance. Finally in 1990, the Burra Charter, officially named “Process of Managing Places of Cultural Significance”, gave the most important element for discussion in modern conservation, by considering the values of heritage and the significance assessment as necessary part of the evaluation of possible interventions. Also the Burra Charter proposed that values could be affected by the

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10 Dennis Rodwell, Conservation and Sustainability in Historic Cities (Chichester, GBR: Wiley, 2008), 1.
12 Ibid., 13.
use of the building, its meaning to the people and its relation to the place, together
with its physical characteristics.\textsuperscript{14}

Since the beginning of the activity of conservation of architectural heritage, a
long debate has been developing; the combating ideologies of conservation versus
restoration. Those who defended the idea of conserve monuments and buildings in
the shape they found them, intervening on them only for maintenance. In the other
hand were the defenders of restoration, that is the idea of intervening the buildings to
return them to their original shape and characteristics.\textsuperscript{15}

During the 19\textsuperscript{th} Century, Europe saw the emergence of the restoration current,
which actually looked for the reconstruction of heritage. Restoration as understood in
that time was performed as a way to rebuild – mostly destroyed – buildings in ruins;
this was done with little to none research and limited to the supposition of how the
original building could have been. They based the restoration in the objective to
achieving symmetry and following what they thought were the intentions of the
original design. The consequence of that restorative mentality was actually the
destruction of architectural heritage. It is relevant the example of the Gothic
churches; they were deprived of later additions (later to the Gothic period) or other
styles; this was done in the name of an idealized pure Gothic style.\textsuperscript{16} Today
restoration is rarely use in architectural conservation; it has remained in practice
mostly in archaeology, where for touristic reasons some places are restored in a
reversible way or evidencing the original and the restored parts of the structures. In
architecture, restoration is used mostly in the case of buildings that have lost large
parts of their original structure or characteristics or that have been affected by
unprofessional conservation practices. Restoration interventions must be done under
the strictest historical research before the intervention.\textsuperscript{17}

Today architectural conservation is considered the main denomination for the
aggregate of processes and disciplines that look for a building to retain its cultural,

\textsuperscript{14} May Cassar, "Sustainable Heritage: Challenges and Strategies for the Twenty-First

\textsuperscript{15} Ascención Hernández Martínez, "Conservation and Restoration in Built Heritage: A
Western European Perspective," in \textit{Ashgate Research Companion to Heritage and Identity},
ed. Brian Graham and Peter Howard (Abingdon, Oxon, GBR: Ashgate Publishing Group,
2008), 246.

\textsuperscript{16} Orbasli, \textit{Architectural Conservation}, 17.

\textsuperscript{17} Ibid., 50.
Historical and architectural significance. Conservation includes maintenance, preservation, restoration, reconstruction, reconstitution and adaptation. Conservation refers also to the management of cultural resources. The study of conservation is also important in the economic and politic processes related to maintaining historical buildings. Conservation projects need approval from the owners and the procedures to conserve should be approved by authorities, both for legal and budget reasons. Information of ethics and procedures is the main tool that conservationists have to convince owners and other stakeholders about the need for their active involvement in the process that would better conserve the building.  

Architectural Conservation has been for a long time a static discipline, looking only for ways to maintain the original state and characteristics of the buildings. It has been until the decade of 1970’s that the discipline has been influenced by ideas of sustainability and the increasing interest of architects to work with already standing structures and adapting them to keep their usability.

Heritage buildings constitute just a part of a bigger system that influences them and that consequently is influenced by them. Such system is the context in which the buildings are located; it includes elements like area, city, country, landscape and society. A building is not an isolated element; this means that to study it properly, conservation professionals have to undertake many more considerations than just the structure itself. These considerations are translated into heritage values.

1.2 Architectural Heritage Values.

1.2.1 What are “Values” in Heritage Studies?

There are many definitions to the concept of value; the two more widely known are “value in economics” and “moral value”. None of those varieties is directly

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18 Ibid., 9-10.
19 Ibid., 6.
20 Value in economics relate to the balance between the worth that people gives to a service or a product and the worth that the market gives it. Source: http://www.investopedia.com/terms/e/economic-value.asp
related to heritage studies and conservation, where value refers to qualities and characteristics given by the cultures, societies and individuals that generate them at different times. Values have become more and more important in conservation and heritage discipline in the last years. To this, Nigel Walter says that conservation nowadays focuses on values “their identification, description and prioritisation.”

Values were a call by 19th Century philosophers in their need to justify themselves in a world dominated by science, which reduced any study of reality to that which could be limited and measured. Values are developed from the philosophy and the art history into the architectural history and intended to be a measurable element in their “scientific” study.

Despite their origin as intended systemic hierarchy with scientific aspirations, values are primordially subjective and interpretative exercises that depend on the cultural determinants of the individuals that generate them. Cultural values are strongly related to built heritage values. Architecture is a cultural product and as such all edifications are influenced by the culture and time that created them, to this respect Marta de la Torre and Randall Mason say that: “Value has always been the reason underlying heritage conservation. It is self-evident that no society makes an effort to conserve what it does not value.”

Each culture has its own values, and even within the same culture values could be different from one community to another and from one person to the other. For example Europeans could have similar aesthetical value, but French aesthetics differ from Czech ones and even in different regions of France the values

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21 Moral value refers, in morality, to the standards of good and evil. Source: http://www.slideshare.net/vaibhav1996/moral-values
22 Moral and economic values are indirectly related to heritage by the evaluations of economic impact and the influence of moral values on sociocultural values and personal attitudes towards the built heritage.
23 Orbasli, Architectural Conservation, 38.
25 Ibid., 636.
27 Orbasli, Architectural Conservation, 12.
tend to be different. Values can be in conflict with other values, especially when they are used to evaluate cultural heritage.\textsuperscript{28}

“Books on architectural history and theory make it clear that architecture cannot be isolated from its historical momentum, culture and specific context. Thus the concept of architectural value is comprehensive, having not only personal but also community and cultural connotations.”\textsuperscript{29}

Heritage values are mostly subjective and contingent (cannot be proven).\textsuperscript{30} They are not permanent or constant and need to be generated for particular cases each time a building or heritage piece is analysed. Values are usually generated by professionals and groups of interest. In the case of architectural heritage values, usually professionals related to architecture and engineering are the people charged with their definition, nevertheless also professionals of art and humanities have a say in the values definition. More recently stakeholders and the society in general are being included in the values definition process.

The discourse on values is highly important to our subject. It has been defined that the role of conservation is to “preserve and enhance values”.\textsuperscript{31} On their part, adaptive reuse and energy retrofitting also work with values but in a more controversial way, as they could be accused of threatening traditional values in built heritage. Paul Drudy defines conservation from the relevance of values:

“Building conservation is distinctly different from the physical processes of repair and adaptation. It is an attitude of mind, a philosophical approach, that seeks first to understand what people value about a historic building or place beyond its practical utility and

\textsuperscript{28} Ibid., 38.
\textsuperscript{31} Orbasli, \textit{Architectural Conservation}, 38.
then to use that understanding to ensure that any work undertaken does as little harm as possible to the characteristics that hold or express those values.”

Heritage values are widely considered the guiding principle that determines the relevance of historical buildings for conservation; ironically is not very clear or under consensus how to use those values in the conservation planning process and decision-making. The use of values changes in each region and policy that applies them. Their identification is a process widely homogenized, but not unified, their specific use is not under consensus at all.

The values of certain buildings tend to change when their function change. Some buildings gain values with the pass of time, attributed by social, cultural and other factors. This is especially important in the area of adaptive reuse, where a building has lost its original meaning that had to the culture that built it and at the time it was built. Those buildings may be modified to adapt to the needs and expectations of a different time and to the modified cultural values of the users. In consequence, the values related to the building itself will change as its use changes, thus making them harder to identify and assess, “values are always changing in some respect, and we should expect this as part of the essential, social nature of heritage. For all these reasons, heritage values cannot be objectively measured and broken down in the same sense that a chemist, for instance, can analyze and break down a compound to determine its constituent parts.”

Marta de la Torre recognizes the mutability of values and the complex process to identify them as an exercise more complex than how “old school” conservationists thought: “The values of heritage are not simply “found” and fixed and unchanging, as was traditionally theorized in the conservation field (i.e., the notion of heritage values being intrinsic).”

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34 Orbasli, Architectural Conservation, 38.
36 Ibid., 7.
1.2.2 Typologies of Values.

In heritage studies exists the tendency to create sets of values in order to establish some kind of order and methodology; proposing typologies of values does this. Having a consistent “values typology” could be beneficial to compare the same values in different cases. Having different typologies create a disorder and unbalance on the different heritage assessments, that is why usually countries tend to adopt some standard typology, but others have different systems of values in each jurisdiction. A typology is a way to establish constant and standardized criteria, but this cannot be done by a complete generalization and no rule can be applied to the generation of typologies because, just as the identification of values, it comes from a subjective appreciation. Values typologies are intended to be a guide for heritage assessments in a certain country, region or city’s conservation policies, nevertheless the typology has to be revisited for each project because of the different nuances between buildings. According to Randall Mason, “English Heritage” typology of values of 1997 can be considered the most consistent up today.37

Maybe the first typology of architectural values in recorded history is the one created by Vitruvius in the 1st Century B.C., he presented a triad of architectural values that for centuries was accepted as the most relevant order of architecture. Vitruvius came under great relevance for architecture since the rediscovery of his works by some Italian architects in the 15th Century. From that moment to the first half of the 20th Century, Vitruvius have been the main source for theorists of architecture and therefore for architectural conservationists. The Vitruvian triad of architectural values is: Firmitas (firmness, durability), Utilitas (usefulness, commodity) and Venustas (beauty, delight).38

There are many professions (architecture, engineering, architectural history, art history, urban planning, etc.) related to conservation and heritage of the built environment and it is expected that each of their professionals and experts propose different sets of values. In consequence values would be different depending on who identifies them. The most common values of cultural heritage are historic, architectural, and archaeological values. Those values are more culturally defined

37 Ibid., 10.
38 Emmit, Prins, and den Otter, Architectural Management: International Research and Practice, 12.
and tend to be easy to identify among societally related individuals. There are other
values are more emotional, symbolic or spiritual. Those kinds of values are more
personal, hardest to define in larger groups and societies. 39 “The values to be
addressed within architectural design cover a wide range and differ from cultural,
ethical, aesthetical, philosophical and societal dimensions (mainly having their
expression within the public and professional domain) to organisational, functional,
technical and economic aspects (mainly influenced by the clients, users and project
partners involved).”40

There are many typologies within conservation methodologies and best
practice handbooks and would be useless to describe them all, instead in the
following lines I will present a selection of types of values that could be found in
several books and handbooks:

- **Age**: is a value that changes in with time and is usually related to the rarity to
  find an example of a building with the same use. As the use changes with
time is less likely that the building would survive and those which achieve to
do it are highly considered for protection.

- **Rarity**: is defined by the availability or scarcity of buildings of one type or
  built with some construction technique or belonging to some architectural
current in a determined area.

- **Architectural value**: refers to the qualities of the building from its design and
  proportion or the significance of the building for architectural styles. Also
building considered masterpieces of some architects or relevant examples of
constructive methods.

- **Artistic value**: the quality of craftsmanship or pieces of art that are integrated
to the building, this could include murals, sculptures in the facades or
frescoes, among others.

- **Cultural value**: the characteristics of a building that give information about
  enduring ideas, materials, symbols and habits passed through time in the
same society.

40 Emmit, Prins, and den Otter, *Architectural Management: International Research and
Practice*, 4.
- Emotional value: also called “Attachment values”, these are the result of people’s emotional relation with a building; when they feel respect, melancholy, devotion and many other for an specific building.

- Historic value: is given to buildings that had some role in history or housed certain events that link them to a period or fact.

- Landscape value: a building is part of a context formed by the urban form and the natural characteristics of the land it occupies, these values are those that define how a building contribute or helps to define the character of a landscape as an aesthetic whole.

- Religious value: these are given by the spiritual relevance that a building have for certain faith.

- Political value: it is related to other values like religious, cultural and historical. It refers to the use that politicians give to buildings in order to justify or support a discourse. Marta de la Torre defines political value as the “use of heritage to build or sustain civil relations, governmental legitimacy, protest, or ideological causes—is a particular type of cultural/symbolic value...political value can be interpreted through a positive lens—as a key contributor to civil society—or, more cynically, it can be interpreted as a political tool used to enforce national culture, imperialism, postcolonialism, and so on.”41

- Technical value: building can be documents of the past, analysing them can teach us how architects and engineers worked on structures in other times. If a building can informs us about technical and material procedures in other times then it has a knowledge value.

- Educational value: the possibility to use the building as a resource to learn and teach about the past.

- Social value: this is the meaning of a building to a local community or the society in which is placed. The use that society gives to the building defines its social value.

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- Economical value: this is most controverted, as value in economics is a complex subject. Economists have the most effective and well-established form of assessing values, nevertheless the values generated by them are usually disconnected of the social and cultural elements surrounding heritage.⁴² The two main classifications of economical value are:

  a) Use value: is the capacity of the heritage building to generate income, like in the case of fee entrances.

  b) Non-use values: Are those that do not generate a profit related to the socio cultural values but are more into the possible future exploitation of the building than the actual present day chances. These are values assigned by the people to the building. People could decide to invest in the building just because they feel that they can use it for something in the future, not being sure for what.⁴³

Other typologies of values reduce them to a few general categories. In (Table 1) I am showing a classification of values addressed by the most relevant typologies in conservation. The British society of conservation called Historic England (formerly English Heritage) categorizes as “cultural” what others call “sociocultural values”.

1.2.3 Sociocultural values.
In the next chapter I will develop a proposal to approach sociocultural values in relation to notions of sustainability and energy efficiency, for this reason I think it is important to describe them. Marta de la Torre wrote that “Sociocultural values are at the traditional core of conservation— values attached to an object, building, or place because it holds meaning for people or social groups due to its age, beauty, artistry, or association with a significant person or event or (otherwise) contributes to processes of cultural affiliation.”⁴⁴

The sociocultural values that are associated with architecture are highly mutable because they depend on the mentalities and historical moment. Usually these

⁴² Marta de la Torre and Randall Mason, "Introduction," ibid., 4.
⁴⁴ Ibid., 11.
values are expressed by some kind of cohesion between individuals. Formerly religion and religious practices were two of the most important sociocultural values. Nowadays in more secular societies these values are represented by social activities, identities and attitudes towards the change, use and continuity of the building. Some churches in the more secular countries of Europe (especially Northern Europe) have lost most of their religious significance within the society, but not their cultural importance, which has been substituted by more civil or social values; former places of cult are becoming meeting points and places for social gatherings.

The problem behind assessing sociocultural values in the 21st Century is the decision of who generates them. Traditionally, experts in art, history and architecture have independently defined values; generating them as the result of academic determinisms without considering anthropological, environmental, ethnical, and other kind of factors; even the economical values have been traditionally neglected (and assessed separately as other category of the typologies). Traditional or professional generated values hardly consider the society; this translates in a consideration of historic buildings as jewels of time detached in significance from their current users.

Usually are humanists those who identify sociocultural values of architectural heritage. The rest of the values within a typology are identified by a wide array of professionals from other disciplines. Usually an economist would identify the economical and market values, while architects and engineers would do the technical assessments. In this context of work the humanists (art and architectural historians in their most part) are limited to analyse the forms of using the buildings, reasons for use, religious or not religious significance, and community’s “attachment” to the building.

Degrees of advancement have been achieved in the identification of sociocultural values. Some currents in heritage conservation are claiming the importance of including a wider array of stakeholders into the decision-making and policy-making for conservation of heritage, thus succeeding a more democratic exercise of conservation and values identification.\(^45\) Sometimes conservation specialist’s opinion can be against the more democratic opinion. Including more

\(^{45}\) Marta de la Torre and Randall Mason, "Introduction," ibid., 4.
participants into the decision-making surrounding heritage conservation includes the risk of the approval of group-decisions that could not be in the best interest of the heritage buildings. For example, if the society and the politicians decide that some building should be destroyed, while the conservation professional defends the building. That makes us doubt if the opinion of the society should be considered directly or considered by the specialist as part of the whole values assessment.

Traditionally conservation specialists have assessed socio-cultural values without consulting with the society itself. Architectural historians could tend to define social values on documented knowledge, thus generalizing social attitudes and mentalities towards heritage. In recent years organizations have taken the custody of historical buildings of great sociocultural relevance and have been including the society as a form of stakeholders for consultation of proposals. The degree of participation and decision power of societal elements varies from region to region, country to country.

Without invading technical ground to which the humanist is not prepared to assess, he is now forced to include some degree of interdisciplinary work. I think that humanists should be able to use technical and scientific data to include it in the identification of sociocultural values. Some sociocultural values can be identified through the inclusion of ethnography and anthropology as methodologies for identifying and assessing values. “Heritage conservation is best understood as a sociocultural activity, not simply a technical practice; it encompasses many activities preceding and following any act of material intervention.”

In (Table 2) we can see the most typical values associated with the sociocultural element, confronted with the economical values.

**1.3 Assessments of Significance.**

**1.3.1 Assessment of Significance: the Use of Values.**

Once the values of a building have been identified using a defined typology we have to find some use to those values. Maybe this is the hardest point in the conservation

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process: the assessment of significance. The result of this step will tell us what can be classified as a heritage or what is subject to conservation. Also the assessment will lead us to plan the levels and elements involving an intervention of adaptive reuse. An assessment of significance is the best form to evaluate a monument or building and determine if it receives the status of “heritage”, if is viable to invest in it, and what kind of interventions should be applied to the buildings. 

Significance is the starting point: it is the reason why, from a heritage perspective, the future of a place may be a matter of public interest.

Assessments of significance (or significance assessment) are also called assessment of cultural significance or only heritage assessment. All those formulas relate to the same process, the evaluation of relevance of a building in accordance to the identified typology of values. According to Marta de la Torre “The articulation of heritage values in order to decide weather a building should be restored, modified or categorized as heritage, is what we know as “cultural significance.” Additionally according to Vit-Suzan: “The value of heritage rests in its power of signification.”

The survival of an old building and its transformation on a historical building and therefore in heritage, is defined by the significance that it has to the country, society and government that maintains it. Just as the values that define it, significance is a subjective process. The lost of significance can come from a shift in political power or a change of a national values among others. A lost of significance can mean the end of a building. “The significance of a building or place of historic, architectural and cultural importance is its most defining value, the loss of which will devaluate its cultural significance.”

According to Historic England in their good practice handbooks of 2015, “The significance of a heritage asset is the sum of its archaeological, architectural,
historic, and artistic interest," 51 in other words, is the result of the identification of values. The assessment of cultural significance tends to include all the heritage values defined in a typology, even those that are not properly cultural or social. The inclusion of a wider sense of values is deemed necessary because other factors, like the economical values, may also affect the future of the building, in consequence it significance would be affected. While all the values are considered for the assessment of significance, it is until this stage that values are really confronted one with the other in the traditional conservation process, which could add some confusion in the presentation of the information; maybe a more interdisciplinary approach of working from the identification of values would contribute to the establishment of standardized methodologies for assessing values.

Talking about the problem of finding an standard in cultural assessments has been one of the main discussions in the literature surrounding heritage, ever since it has been accepted that many variables are involved in heritage studies; politics, local law and local culture and societies differ from one building to the next. In consequence as Marta de la Torre mentions, there are not “recognized and widely accepted methodologies” for assessing values on cultural heritage. 52 Even then it is widely accepted that all the values considered in a typology are to be included in the assessment, just as Marta de la Torre explains:

“Cultural significance is used here to mean the importance of a site as determined by the aggregate of values attributed to it. The values considered in this process should include those held by experts—the art historians, archaeologists, architects, and others—as well as other values brought forth by new stakeholders or constituents, such as social and economic values.” 53

Fortunately for the future and validity of heritage studies, the inclusion of non-experts in the identification of values and assessments of significance is now a

52 de la Torre and Mason, “Introduction,” 3.
53 Ibid.
reality. The idea of old conservation societies of leaving the responsibility only for the specialists has already subdued, causing a renewed debate on the subject, just as Marta de la Torre says:

“In recent decades, the concept of what is heritage has evolved and expanded, and new groups have joined the specialists in its identification. These groups of citizens, of professionals from other fields, and of representatives of special interests arrive in the heritage field with their own criteria and opinions—their own “values”—which often differ from our own as heritage specialists.” 54

The problem with the traditional identification and assessment of values is that stakeholders remained as evaluators at the end of the assessment; they were required to give their consent to the conservation or adaptation works on a building, but they do not participate in the process of assessment. Even now this is the most practiced method of pre-intervention process for decision-making. With or without considering the non-specialists for the significance assessment, a final report has to be filled, in which any stakeholder or anyone interested would receive the information on which are the values and which is the ranking of values according to priorities and interests.

A good significance assessment consist of three steps, that should be included in the report for the stakeholders and that is the result of the work of all the actors intervening in the assessment: 55

1. Identifying all the values of the heritage building.
2. Describing the values one by one.
3. Integrating and ranking the different values.

The first step, the identification of values, is the process that I described above, in other words is the establishment of a typology. The second step is a description of the typology elements. As I already mentioned, the description of some values have to pass by the consideration of defined specialists, while others

54 Ibid.
have to be part of a case-specific research, like history of the building and artistical valuation, etc. “No single discipline or method yields a full or sufficient assessment of heritage values; therefore, a combination of methods from a variety of disciplines should be included in any comprehensive assessment of the values of a heritage site.”

Maybe the most complex step in the assessment process is the description of the values, for which there are some tools that each discipline could use, some of those are:

- Economic impact studies.
- Contingent valuation studies.
- Ethnographic studies.
- Anthropological field studies.
- Historic contexts written by historians.
- Scholarly analysis of artistic merits.

The third step is maybe the most subjective of all the already very subjective process of significance assessment; even then it is also essential to synthetize the knowledge acquired by the description of the values of the typology. The final ranking should be made accordingly to the possibilities and intentions of the stakeholders and the motivations to evaluate an intervention.

1.3.2 The Statement of Significance.

All these three steps would generate a final “statement of significance”; which is a document that shows that a series of considerations have been taken before formally proposing an intervention for conservation or adaptation of a building, or simply to list the building in a heritage register. A statement of significance is the public presentation or document containing the results of the assessment of significance and identification of values. It should not be written as a complicated document for professionals, but as an understandable communication to be read by stakeholders, investors, and the general public.

Also the statement of significance should be limited to identify and communicate the assessed values, as Marta de la Torre says:

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56 Ibid., 6.
57 Ibid., 24.
“It is important to stay away from statements that privilege some values over others—that is, if one decides early on that value A is less important than values B and C, the tendency in case of conflict would be to sacrifice A for the sake of B and C; if the values are not ranked, more efforts are likely to be made to find policies that respect them all… what is suggested is an evaluation of the degree of importance of a particular value (unique, important, typical, etc.) of a site when compared with that value in related sites.”

The statement of significance would inevitable include some degree of subjective prioritization. Also we must remember that the statement of significance is an element that will be included into the extended justification for the intervention. Into such justification also other elements could be included, like an explanation for the reasons and proposed advantages of the proposed intervention, the advantages to the building, the community and the local or national interest. Because of this subjective nature is that the assessment of significance cannot be presented as a defined measure, as the significance thermometer that some authors have tried to force into the discourse. Instead, significance would be used to take decisions on the future of the building.

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58 Ibid.

2.1 Principles of Sustainability in Architectural Conservation.

Trying to present a broad definition of sustainability would be useless for the present study. Enough discussion exists in the subject and many articles and introductions are devoted to the definition of sustainability. In this case I will limit myself to mention the most basic definition, that is also the most relevant, the one given by the World Commission of the Environment and Development, (the Brundtland Commission) in 1987: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

This definition can easily be translated to any discipline, meaning that sustainability objective is to perform some activity considering that its validity has to endure without affecting or depleting the resources of the future that would not allow us to keep performing it. Sustainability promotes welfare by securing a constant and rationale use of the available resources and permitting a constant grow of the economy and the society without abusing the environment.

“Sustainability has also proven to be politically resonant (even after twenty or so years) and practically useful because the principles are a flexible frame of reference rather than a fixed benchmark or rigid method (and, not surprisingly, sustainability has been criticized for the same reason by those who wish for inflexible environmental standards).” At the beginning of the 21st Century, the concept of “sustainable” has become a prerequisite in many human activities, sometimes it is understood only in the environmental sense, assuming that if some action is environmental positive then it is automatically sustainable. In reality a sustainable activity has to fulfill more prerequisites beyond the environmental responsibility.


Sustainability is based on three main aspects: environment, economy and society. The quest for sustainability is to bring them to act in harmony.\textsuperscript{61} “Meeting sustainability goals is dependent upon economics, community, social values, and culture. Social and cultural values are critical aspects of the dialogue about sustainability… Sustainable building requires balancing economic, social, cultural, and financial demands with the need to responsibly manage human interaction with the natural environment.”\textsuperscript{62}

The principles of sustainability in architecture (as in other disciplines) are not ingredients for a receipt; sustainability is not a prescription but an attitude. Many architects have embraced the idea of “green” architecture, which derives from an environmental consciousness but that leads to some confusion on what is only green and what is really sustainable.\textsuperscript{63} “Even if with the wave of a green wand, every building constructed from this day hence has a vegetative roof, is powered only with renewable energy sources, and is built entirely of environmental appropriate materials, sustainability would be still far from fully realized.”\textsuperscript{64} To really reach a sustainable architecture we have to consider the general aspects of sustainability, together with specific aspects for architectural design. An important area to focus and that would help both the new architecture and the conservation of the old architecture is that of the materials in use. “Sustainable design encourages the use of natural and renewable materials, new technologies for control of energy use, materials and products that have a long life and can themselves be recycled, and materials that can efficiently be maintained and renewed.”\textsuperscript{65}

Heritage conservation is by itself a form of sustainability. The simple fact of preserving the resource (buildings) for the future generations makes the practice of conservation an essentially sustainable discipline. The fact that a building is kept in constant use is by itself a factor of sustainability, the constant development of

adaptations could also be considered sustainable. When a building stands without use then we can really talk about an unsustainable structure. In this sense modern architectural conservation is a way to promote the sustainable use of buildings.\textsuperscript{66} Despite this first notion, the old buildings could be highly unsustainable, especially some monumental buildings that have been in constant use. On the other hand, a building’s sustainability can be improved with conservation techniques, applying the measures that ensure a better performance in environment, economy and social development within a standing structure.

Sustainability in historical buildings looks for the maintenance and conversion of the existing values, without their extinction. While some values are added, it is understood that the older values should be kept or enhanced. “As preservation teaches us all to better value the past, it also helps us to fully awaken to our responsibilities to the future. This is the unbreakable bond between preservation and sustainability.”\textsuperscript{67}

In many cases, historical architecture is made with durable materials, nevertheless when some material is not longer durable or contradictory to the notion of making the building sustainable, a possible intervention to replace the material could be proposed. Then again it is necessary to make an assessment of significance and evaluate the relevance of the material for the building and the possibilities to replace it.

Some of the measures used in architecture and architectural conservation, and that are consider to help to the sustainability of the building, the environment, economy and society are:

- Use local materials in construction and conservation interventions. This allows helping the local economy that distribute those materials and also reduces the costs and the embodied energy that is consumed to transport materials form distant places.
- Recycle some materials. In case of a reconstructive intervention that would require a partial demolition of the structure, the reconstruction can be done

with the same materials of the demolition. Also the use of materials that otherwise would be considered disposable can be used to reduce the exploitation of new resources.

- Use less industrialized materials. The use of more natural materials in construction and conservation promotes the reduction of exploitation and production of unhealthy or contaminant products. Also a material with less steps in its processing is potentially more environmental friendly and less expensive.

- Prefer traditional techniques to work with the materials. Historical buildings were erected with efficient techniques from the past, and those techniques may still be viable and effective. Again, the less industrialized process are preferable when intervening or even building a new structure.

- Avoid mechanical ventilation systems. It is well known that during the 20th Century, buildings were filled with ventilation machines to improve the conduction of air, a response to the enclosed spaces hidden by metal and glass exteriors. In conservation and in architecture as well, it would be highly sustainable to avoid the installation of such systems and instead prefer the natural ventilation systems. For example the “Passive House” technology.

- Minimize water and electricity usage. The old and widely known measure to save money and to protect the environment.

- The building should be easy to use. A complicated building makes a complicated life for the users. Some buildings with highly advanced technology require a platoon of technicians to maintain it in function; while for the normal user the operation of the building remains a mystery; this is unsustainable.

Taking into account all this principles, an intervention can be made by specialists after an evaluation of significance and some other pre-intervention analysis that are more related to the engineering possibilities of the building and the budget. In order to maintain a building in shape and updated, it is important to re-analyze the values and sustainability of the building around four times per century. “It is common… to look at periods of 25 years or more when doing an analysis, so
that maintenance and replacement costs over the full life cycle of the equipment or system are taken into account.”

One of the problems with intervention in historical buildings is when unprofessional architects or technicians carry out the work. The possibility to affect the significance, authenticity and sustainability of the building is real, ever since an unqualified treatment and plausible destruction could lead to an even higher and harder reconstruction or repairmen intervention, or even could put in risk the classification of the building as historic.

It is a misconception to think that only new architectural projects can be done really sustainable. Some believe that only new built cities can be done really sustainable, and therefore is desired to demolish old and unsustainable buildings to rebuild some new sustainable structure in its stead. “We cannot build our way to sustainability; we must conserve our way to it.” The best way to reach a sustainable building is by improving conditions in existing buildings, one of the reasons being the destruction and reconstruction of the embodied energy.

Embodied energy is the measurable amount of energy needed contained in the existing building. It is the energy needed to produce and transport materials to the construction site and the energy consumed in the construction process. Embodied energy remains in the building and conserving it, is a major concern on sustainability and conservation. Demolition of a standing structure means the destruction and irreparably lost of embodied energy, thus demolition of buildings is unsustainable. “In the future, ‘significance’ deliberations may consider energy efficiency based on structure’s embodied energy index as primary criterion, above general architectural and historical significance.”

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2.2 Adaptive Reuse of Heritage Buildings.

Adaptation in the context of architectural conservation means to “change the use”, in order to extend the useful life of the building. Adaptation includes many possible forms of intervention in an existing building, some of which are called: renovation, refurbishment, remodelling, reinstatement, retrofitting, transformation, modernisation, recycling and adaptive reuse. 72 “Preservation promotes a culture of re-use. Stewardship 73 is erected on a foundation of conservation, but it implies more than keeping existing resources, it also means valuing them. Historic preservation conserves existing resources not only for their material value but also as primary sources of the cultures that created them.” 74 “For historic buildings needing repair, alterations or an addition, the most flexible intervention strategy is rehabilitation (adaptive use), which preserve those portions and features that convey the structure’s historical, cultural, or architectural values while making compatible use of the property possible.” 75

Modern views on heritage conservation, those that include perspectives of sustainability are widely rejected by the traditional professionals of conservation; they prefer a hard line approach of conserving the buildings exactly as they found them. 76 Adaptation is to use an existing building and transform its use by transforming its structure to adjust to that new use. That approach is highly sustainable and positive for the conservation of some historical buildings. Adaptation happens when a building has reached the end of its functional or economical life and demolition wants to be avoided. 77 “Through the concept of adaptive use, alterations

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73 Stewardship: is the act of taking care or managing something.
were allowed that could enable buildings to continue to contribute to the economic vitality of a community.\textsuperscript{78}

As I already mentioned, the use and reuse of already existing buildings is sustainable, specially against the idea of demolition and the idea of leaving the old buildings as they are and try to build sustainability in exclusively new architectural and urban projects. The demolition of a building is considered unsustainable because there are multiple factors that create a loss of energy: first the embodied energy of the original building is extinguished with the use of the energy used for the demolition; following a new building would be erected using a full charge of new embodied energy. Therefore it is much more sustainable to use the existing embodied energy and just adapt the structure to change the use.

There are two forms of adaptations according to the use change: “within use” and “across use”.\textsuperscript{79} An adaptation within use is when the original project is transformed but the base use is changed, like a medieval fortress that is adapted to serve as military post. If adaptation is made across use it means that the use of the building has been changed completely, this is when the medieval fortress would be changed into a hotel.

Obsolesce is the trigger for adaptation. It refers to the lost of use of a building, this carries also a lost of significance and puts the building in danger. “Obsolesce is a perceived as a problem of economic and social decay. Uncertainty and social insecurity are manifest as vandalism and graffiti, breaks-in and illegal occupancy.”\textsuperscript{80} When a building becomes obsolete in use it comes to the risk of demolition or physical decay. Conservationists policies could create obsolesce, by not allowing historical buildings to change their use and adapt to it.

To decide to conduct an adaptation intervention is not an easy task for the stakeholders of a heritage building. There are elements like nostalgia and social values that could make the decision complicated. Some people do not want to see a church, place of worship, transformed in a restaurant. Some others would not like a fortress that could be an element of military pride, to become a hotel. The fear of the

\textsuperscript{78} Tyler, Ligibel, and Tyler, \textit{Historic Preservation. An Introduction to Its History, Principles, and Practice}, 54.


\textsuperscript{80} Ibid., 96.
lost of significance and authenticity is constant before the adaptation interventions assessments. On the other hand if the building is left unused, untouchable for its social or historical importance, then obsolesce is the next step and therefore decay.

Another opposition to the decision making of adaptation is the hard line conservation. Many conservationists and stakeholders would prefer to leave the building just as it is in its form and functions, even when accepting a change of use or not. That mentality goes against the architectural fundament of giving buildings specific uses and design in accordance to the use.

Adaptive reuse has a consequence on heritage values. The values of use and architectural authenticity or aesthetics may be affected. In fact some values are extinguished while others are created. A church that is adapted into a restaurant would lose its value as worship place, but it will gain values of sustainability due to the continuing use and the possible modern considerations for the intervention. It will gain a value as economical viable because it would generate income.

Conscious of the constant changes of the uses of a building along the ages, conservationists now prefer to adapt heritage architecture in a way that may be reversible. If the values and needs of the society change then the use of their buildings will change. Modern conservation tries to adapt in a way that the new use would not be permanent and, if needed, future generations would have the possibility to change the use of the building or return it to a previous stage of use. On the other hand, some conservationists prefer to change the building completely, mostly in the inside, leaving the historical elements of the outside. Less popular interventions include partial demolitions and/or extension of the existing building, sometimes combining old architecture with contemporary one.

Changing the use of a building gives us a great chance: to improve its sustainability. The main way to do this is by improving its energy efficiency. By using the recommendations of materials and interventions already explained, we approach to the possibility of also improving the building, not only by changing its use or making maintenance works and repair with sustainable materials and sustainable practices. Together with conservation interventions and possible adaptive reuse interventions, comes the energy-efficiency interventions.
2.3 Energy-Efficiency Interventions.

Energy-efficiency is important for all kinds of buildings. “Historic buildings, like all buildings, must be operated with a commitment to energy economy.”

Saving energy would also save resources to produce that energy and save the money used to pay that energy consumption.

Historical buildings are considered by many to be wasteful of energy, inefficient, and therefore undesirable or unsustainable. This is not always correct; in fact sometimes they have better energy performance than some modern buildings. At this respect, Jean Carroon says:

“...A common misconception is that historic buildings are energy hogs; this is contrary to the facts. A systematic tracking of the energy use intensity (EUI) of all commercial buildings in the U.S. and Canada finds that those constructed before 1920 actually have a lower EUI than those in any other decade until the 21st century.”

On the other hand, the data on energy expenditure could be misleading, and not totally related to heating expenses. On that situation, William B. Rose talks about more data coming form United States and a plausible interpretation of its causes:

“The U.S. Department of Energy's data on energy consumption shows that older residential buildings have higher energy usage for space conditioning and that houses built during the 1970s energy crisis show the greatest energy economy. But the data also show that commercial buildings have increasing energy expenditures with later dates of construction. Many factors may contribute here, including air-conditioning, lighting, and ventilation improvements occurring in newer building.”

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82 Ibid., 16.
84 Rose, "Should the Walls of Historic Buildings Be Insulated," 16.
Of course, this would not be the case for all historical buildings, but it is possible that some heritage buildings are much more conceived to endure climatologic conditions and availability of resources, than many architectural works of the 20th Century that were constructed to satisfy aesthetical demands from different design currents.

For a part, the use of locally available materials together with ancient knowledge on how to use them, led to ancient builders to erect constructions that adapted well to the local climatic conditions. Also before the existence of modern heating, lightning and energy systems, people had to deal with darkness, warmth, winter, and other phenomena without technology. Materials and design were the answer of their time. In more modern times with the coming of the technologies of energy and heating; was that the relevance of the materials performance was almost lost. Now with the environmental consciousness and the emergence of sustainability, the need to save energy has retaken a paramount position in architecture, and therefore in architectural conservation. Energy-efficiency interventions deal with the adaptation of the energetic conditions and consume of energy of a building. The most important factor for energy efficiency in Europe is heating.

The main problem of historical buildings to conserve heat is “thermal leakage”; due to little openings in the structure and spaces between the joint materials that create points that let the heat to escape, and the air or even water to come inside.85 Such spaces are called “thermal bridges”.

“The first question to ask in energy retrofit considerations of historic buildings is this: does the energy-use profile need correction at all? It may not.”86 This is in part due to the good performance of the original materials and also due to the specific climatic conditions of the site. Some kinds of vernacular architecture are totally efficient and built with ancient understanding of bioclimatic factors. Some other buildings may have already been subjected to energy retrofitting interventions and maybe their energy performance is acceptable. In any case, only a full study of cost-benefit could define if already energy efficient buildings are to be considered to an upgrade or update.

Solving the thermal leakages is one of the main solutions in energy-efficiency interventions; there are some other possible interventions that we will see in detail below. At a glance, some of the recommended interventions are: “Replacing the lamps, fixtures, and/or controls for lighting. Replacing the mechanical plant with new methods of heat generation and distribution and/or upgrading the system controls. Installing insulation in the attic, between roof rafters, in walls, dormers, and the basement and sealing locations of air infiltration. Restoring or replacing single-glazed windows or supplementing them with storm windows.”\(^{87}\) Apart from those general guidelines we will see some of the reasons and recommended interventions to improve energy-efficiency and thermal efficiency in historical buildings.

**Windows:**

Windows are the main source of thermal leakage, both from the thermal bridges in their union points with the building structure, and by direct radiation conduction through the glass of the window. “Glazing accounts for 10% of potential heat loss, with ventilation and infiltration accounting for another 15%.”\(^{88}\) For this case the first measure would be to repair the thermal bridges in the union points of the materials. “Draft stripping window frames and ‘sashes’ can reduce leakage or drafts by 80%.”\(^{89}\) As for the window itself, there are three possible options:

1. Replacing the old window with a modern double-glazed one.
2. Adding an external secondary glazing leaving the original window in its place. This would create a thermal layer between the two.
3. Adding an interior glass that would not be a window properly. This creates the same thermal layer but is a little more discreet.

The first option is the less popular for conservation. “It would neither be sustainable nor cost-effective to replace a 200 year old window that capable of repair and upgrading with a new double-glazed alternative, and even less so if the anticipated life of the new window is only 20-30 years.”\(^{90}\) The other two are more

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\(^{90}\) Ibid., 13.
widely practiced but the third one even more frequently. Another intervention is using old material shutters. “Utilizing the existing shutters, thermal blinds and curtains can significantly reduce nighttime heat loss.”\textsuperscript{91} These kinds of shutters are like the one I am showing in (Figure 1).

In the case of the double-glazing options we must consider the characteristics of each of them and how they affect the building in aesthetics and in performance. The exterior glazing has been much more used in previous times, mostly in the imitation of standard contemporary double-glazing. The big disadvantage of the external glazing is that it could obscure or diffuse the architectural details of the original window, just as we can see in (Figure 2). The other option is to install the interior glazing that usually would be much more discrete. Some examples of interior glazing can be seen in (Figure 3) and (Figure 4).

**Roof:**

As the heat tends to radiate upwards, it is a common that the old buildings rooftops and ceilings create a loss of energy and heat. “The potential heat loss through the roof accounts for approximately 25\% of the total heat loss from a building. It is only second to the heat loss through the walls.”\textsuperscript{92} In historical churches for example, insulation can be applied only to the interior of the attic, resulting in a reduction of the heat loss inside the attic and in consequence a reduction in the heat loss overall. “Attic insulation is easier to install and contributes more effectively to reducing heat loss than adding wall insulation.”\textsuperscript{93}

**Walls:**

The heat loss by the walls radiation is considered the most important one. “In terms of heat loss, walls can account for almost 35\% of the entire building envelope’s heat loss.”\textsuperscript{94} Of course the walls are also the most important constitutive

\textsuperscript{91} Henderson, *Energy Efficiency in Historic Houses*, 12.
\textsuperscript{92} Ibid., 10.
\textsuperscript{93} Rose, "Should the Walls of Historic Buildings Be Insulated," 18.
element of a building, the largest part of its surface. The most well known process of energy efficiency interventions is the insulation of walls. Insulation retards heat transfer by radiation and therefore heat loss, making the internal heating systems more energy-efficient. The most important material used is the insulation plaster but also some other materials can be used, including mud and sheep wool, among others; materials are usually installed in layers. In (Figure 5) I am showing how the internal insulation is layered.

The installation of insulation in historical buildings is controversial. “Insulation may be applied to external walls but the combined thickness of the render layer and insulation can mean that existing architectural detail and texture can be lost.”

Also internal walls can be insulated but in that case the original internal features will be lost or covered. Both internal and external insulation entail the loss of some authenticity and original fabric. Some external (and internal) insulation techniques can imitate the original features of the walls by overlapping layers in the same form; such procedure can be seen in (Figure 6), where a part of an external wall has been insulated and the other part has remained authentic, the features are kept by overlapping the insulation materials.

The major challenge with walls insulation is keeping the main wall free from moisture, so techniques for humidity dissipation are needed in these cases. It is known that insulation could accelerate the degradation of the original walls of a historical building, this mostly because of the enclosure of the original materials that could decrease the wall’s capacity to expel moisture.

Walls can also be intervened to install a radiant heating system; the problem with such intervention is that it is extremely invasive and it would imply the destruction of part of the wall for installation. Alternatively it can also be included as part of an insulation intervention and using both systems. This process is not highly used for its complexity and potential damage to the heritage building. Such intervention can be seen in (Figure 9).

Doors and gates:

“Along with windows, there is a potential of 15% heat loss in relation to external doors.”\(^97\) Intervening doors is the less common practice in energy-efficiency. The most discreet would be the sealing of big doors with plastic materials. The old wooden doors are full of thermal bridges that allow the filtering of external air and heat loss. If the door is filled with silicone or other less invasive materials to seal those thermal bridges, then some gaining are we already making. On the other hand the work on the doorframe and the possible thermal bridges is also a good solution. More recently some doors are being applied an older technique, the internal insulation of the door surface.\(^98\) Internal door insulation can be done with more modern layers that imitate the original design.

Another good solution and highly reversible is the installation of interior lobbies, mostly glass lobbies sealed to the structure and performing a second door also sealed; such solution can be seen in (Figure 7). The internal lobby made of glass has the quality that all the details of the building are kept.

**Floors:**

“Heat loss through the lowest floors is potentially 15% in any building.”\(^99\) Even when the thermal loss is less in the case of the floors, it is also one of the most popular interventions, this is due to the double function that can be applied to the floors: insulation and heating (see “Heating systems” below). This kind of intervention is much more viable in wooden floors, nevertheless some clay and stone floors can be intervened too, with less efficiency in the results compared to wooden ones. The installation of in-floor radiators is a popular heating system for houses, but for bigger spaces the output could be insufficient. In (Figure 8) we can see how the in-floor heating and insulation is installed.

The advantages of floor heating are: that it keeps the users warmer by keeping their feet warm, and also that provides protection to the original fabrics by keeping the stable temperature at around 15° C, and thus preventing condensation.

**Lights:**

\(^{98}\) Using leather to cover the internal face of some doors is an old practice for insulation  
The simplest energy-efficient solution for older buildings lightning is the modernization of the system of illumination. Usually just replacing the older bulbs for contemporary energy saving bulbs can do this.

**Clean energy-generation systems:**

In some cases is possible to provide a historical building with some kind of clean energy generation system; such a system would replace, at least partially the need of consuming energy from the main grid. Some of the possible solutions are:

- Photovoltaic cells on the roof or building grounds. (Figure 10), (Figure 11) and (Figure 12).
- Wind/water generators if the resource can be exploited in the specific area.
- Biomass (biological garbage) generator.

**Heating systems:**

The oldest and more widely used intervention to a building to keep it warm is some kind of heating system. The history of these devices comes from the simple use of a fire inside a building, until the recent radiant floor that I already described.

Modern heating systems work mostly fuelled by gas, and lately by sole electricity. Nevertheless “Electricity is the most expensive fuel per kWh and has the highest carbon dioxide emissions (approximately 2.5 times natural gas emissions).”

A few fireplaces have been identified in a very small number of churches dating from before the 17th century, but most church buildings prior to the nineteenth century in Europe were entirely unheated. It is common that heating systems that are not originally designed for that are to be found in big historic buildings. Many historical buildings were built without any heating system and they were adapted stoves in later years. Changing heating system could go hand-to-hand with the change of use. “Replacing existing boilers with new and more efficient boilers can deliver between 20% and 30% of savings in energy use... Electrical

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100 Ibid., 50. It refers to the energy generation; which in most parts of the world is done by the burning of coal, natural gas and petroleum.
heating is 100% efficient but has significantly higher costs per kWh than heat produced from a modern natural gas or oil fired boiler.\textsuperscript{101}

To decide what kind of heating system is required, the following factors are taken into account:\textsuperscript{102}

- Size and construction of the building.
- Intended use.
- Operative times.
- Locations
- Fuel or energy available.
- Running Costs.

There are three main kinds of heating systems, classified by the kind of heat transference: radiant, warm air, and convection. Each category has the following characteristics:

**Radian system:**
- Positioned in high level.
- Radiate waves of heat.
- Heat reach individuals and they feel warm.
- Not required pre-heating.
- In time it could heat the structure and the space.
- Not effective to heat structures.
- Oriented to the user in the moment.
- High running costs.
- Infrared electric heater is the more expensive in operation.
- Formed by plaque heaters or radiant tubes.

**Warm air system:**
- Warms injected air and in consequence the structure is heated.
- Heat travel through and inside the air.
- If air is recirculate, the running cost are reduced.
- The heating of air moisture can create damp walls, affection for the heritage structure.

\textsuperscript{101} Ibid., 51.
- Needs of fan convectors and heated ventilations.
- Gas-fired heating, extremely inefficient.

**Convection system.**
- Positioned next to the air source.
- Use of convective currents.
- Storage heaters are the most traditional device, together with wet radiators, skirting heaters, under floor heating and heated pipework.
- A boiler may be needed.
- Most of these systems warm the air and the air warms the structure.
- Wet system (also known as hydronic system)- is the most widely used in Europe.
- Floor heating heats the floor before and the floor heats the air.

“It is important to ensure that heating pipework travelling through unheated areas is insulated to prevent unwanted heat loss. 10% energy savings can be made through ensuring that the heating is delivered only where required.”

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**2.4 Thermal Comfort.**
The main objective of the energy-efficiency interventions is to improve the thermal performance of a building. The thermal performance can be measured but also can be felt, and that sensation can be measured too. The standard of temperature appreciation by a human inside a building is called thermal comfort.

Thermal comfort refers to the appreciation of temperature by the human body, in which the sense of temperature is comfortable. Thermal discomfort is caused by climatic influences on the human body. In winter cold conditions inside older buildings, it is possible to feel a thermal discomfort that we are not used to feel in more modern buildings. The cause of the discomfort is the lack of thermal insulation or some of the previous described causes that causes a thermal inefficiency in the building.

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The fact that exist large temperature differences at different heights inside an historical building also affects the thermal comfort. A frequent problem is to have the feet cold because the heat is not correctly radiating inside the building.

All the described possible interventions are designed to prevent radiant heat deprivation. The loss of heat tries to be compensated by the users with the use of more energy for heating. The objective of adaptive reuse and energy-efficiency interventions is to achieve historical buildings in which a lower amount of energy is required to get enough radiant heat in a permanent and uniform way, so the thermal perception of the user would be comfortable.

To achieve a better heat performance, it is necessary to limit the difference between the indoor temperature and the temperature of the surface of the structure. If the temperature were balanced correctly, there would not be violent heat deprivation like cold draughts. Surface temperature is influenced also by the climatic condition, the temperature outside. Buildings during winter should be heated in a conservation temperature of 10-12 degrees when the building is not in use and then when it is in use, it should be heated to a comfort temperature of 15-18 degrees. The level of activity of the user can also affect the thermal comfort, so a building apparently comfortable could become uncomfortable after 30 minutes of inactivity.

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“It is this delicate balance between human comfort, cost-effective energy technologies, and heritage preservation that needs to be achieved and this only may be feasible if there is willingness for dialogue, compromise, and negotiation among different professions.”

In this chapter I will present the existing models that analyse the relationship between thermal comfort experience and sociocultural values. Then I will propose a research approach to understand that relationship in a way that could be useful for the process of decision-making in conservation and adaptive reuse initiatives.

3.1 Existing Research Models.

There are some methodologies to assess significance and standardize typologies of values. It is understandable that some initiatives have been trying to create charters to identify values and work them in both qualitative and quantitative way.

In my research I have identified two kinds of processes of research in which specialists work together with the society: one is the identification of sociocultural values, by the means of interviews, surveys and other forms of humanist research; and the other is data analysis for reporting conditions of thermal comfort in buildings, both historical and contemporary.

Surveys on thermal comfort are focused only in personal satisfaction and how the user perception could affect the engineering needs. In such studies there is not an inquiry on cultural perception linked to the thermal one, nor for societal values towards energy efficiency. Studies on thermal comfort are not academic in general. To this moment there are a number of companies and initiatives that train personnel in how to conduct surveys and interviews to investigate on thermal comfort with a determined population for the interest of some building’s stakeholders. Previous research just describe the experience of the user, not what they understand as values.

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and how they value the building in relation to that feeling of temperature and the energy that takes to reach that comfort. Usually those kind of surveys are centred around the immediate comfort experience, asking questions like “How hot or cold do you feel it?” without considering the cultural view of the individual, limiting to his personal perception of temperature.

Kalliopi Fouseki and May Cassar, from the University College in London, mentioned the case of a residence complex in that city which was studied under one of those survey methods:

“One step forward was achieved in the study of residents’ behaviors and perceptions in the case of the Barbican Centre in London — a Grade II-listed residential and cultural complex built during the 1960s and a typical example of Brutalism architecture. A residents’ survey was conducted to characterize levels of occupant comfort and satisfaction, identify any problems experienced by the residents, and explore possibilities to improve the energy performance of the estate without compromising its status as an iconic example of post-war architecture and planning.”

The method use at the Barbican Centre was the BUS Methodology, which focuses in behaviors and perceptions of the users in relation to the buildings. A global firm of consulting engineers called Arup designed the methodology. BUS is one of their initiatives in training and consulting; they do not do the fieldwork, only trains companies to do so.

BUS methodology processes empirical responses and transforms them in quantitative and qualitative data for analysis. Their questionnaire focuses in asking about the person’s perceptions on air, comfort, lightning, design and noise. The kind of the questionnaire depends on the client needs. The people answering the survey give each answer a graded response in a progressive scale of seven levels. Those levels are standardized so the person could express satisfaction level. A number in the scale, going from 1 to 7, gives the answers. Number 1 is equal to “unsatisfactory”

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106 Ibid.
107 For more information, refer to the webpage: http://www.busmethodology.org/
and 7 to “satisfactory”, this way the user can grade the perception according to an estimated scale.

In United States, the main authority in sustainable building, the U.S. Green Building Council, has designed a multiple use rating system called Leadership in Energy and Environmental Design (known as LEED). The rating system extends to a wide array of operations, assessments and energy-efficiency evaluation. One of the initiatives that the system evaluates is thermal comfort, and it does it with fieldwork also.

The kind of thermal comfort survey processes gives mostly qualitative data; they also use the seven-level scale system to some question. The rest of the questions are about the existence of some facilities in the building, and asking people if they think that the building delivers in a matter of not. Differently from BUS, LEED do not gives a series of quantitative graphics and amount of information to be evaluated. LEED gives points to each category of questions; the points are then gathered and compared with a standardized table sheet. Depending on the points that a building had, it is standardized if the building fulfills a certification or if it needs to improve its performance in some specific area.108

In Europe and United States there are also a quantity of universities that sell their services to companies and governments. Those universities have their own thermal comfort research methods; some include only user surveys, while others include also thermal metric with modern technology. It is common that the work done by universities in USA is balanced by the LEED system.109

Another well know methodology is the one used in the Netherlands, called DuMo:

“The DuMo methodology is used to quantitatively rate the sustainability of cultural heritage before and after renovation (Du = (Dutch for) sustainable and Mo = monument). The method is used in practice in the Netherlands and therefore is more than a theoretical approach. It links quantitative rating of a sustainable value (Du) with a

108 To the LEED system, refer to the webpage: http://www.usgbc.org/credits/eq61
109 The Centre for the Built Environment of the University of California, Berkley, processes thermal comfort surveys under their own method and warrantees the achieving of LEED certifications. For more information refer to their webpage: http://www.cbe.berkeley.edu/research/survey.htm
quantitative rating of a monumental value (Mo) of a historic building.”

The Mo-value is assessed by two building or architectural historians. Each one of them independently rate the Mo-value based on a standardized procedure. The results of the Mo inspection are registered in a standardized sheet and confronted the opinion of the two specialists; they together arrive to a consensus of architectural and historical value and transmit it with a system of points.

DuMo confronts a humanistic part with a technical part to give a quantitative rating. It achieves in giving points to the specialist evaluation of the building, both in the architectural-historical way and in the technical way in order to evaluate how much of a building can be changed without damaging is character as heritage. The problem with DuMo is that considers only the specialist point of view and is not a measure of cultural heritage values.

We have seen three assessing systems. BUS researches on thermal comfort; LEED researches and certifies thermal comfort and sustainability; DuMo assesses heritage value and sustainability characteristics. What all these systems are lacking is the sociocultural approach and the consideration of cultural values in relation with the researched elements of sustainability, energy efficiency, and thermal comfort.

The turning point in the heritage building assessment is taking place from the combination of heritage studies with ethnographic and anthropological methodologies, which are being used in conservation and architectural design; these are being processed mostly on participant observation and research on local culture.

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111 Ibid.
112 Ibid.
David Pokotylo and Neil Guppy wrote an article entitled “Public Opinion and Archaeological Heritage: Views from Outside the Profession”\textsuperscript{114}, in which they reported a research done by applying an structured survey to 963 residents of the greater Vancouver metropolitan area to enquire on the public opinion on archaeological heritage in British Columbia. They focused their questionnaire in five areas: knowledge of archaeology, interest and participation in archaeology, the role of archaeology in modern society, awareness and support of heritage conservation initiatives, and aboriginal stewardship of the archaeological record. They found that the surveyed population has a “high level of interest for archaeology and heritage conservation, but also a high level misunderstanding about the archaeological record and current legislative measures to protect it”. Their study processed a good amount of qualitative and quantitative data and they were able to present a report with tables and statistics, including variables of age, gender and education level that affected the answering of the surveys and showed some repeating standards.

So far, the anthropological and ethnographical researches on tangible heritage are being focused on the sociocultural values and attitudes towards the heritage element itself, they are not considering other influences on the people’s attitude towards an element of heritage that can be used, not only appreciated. The most useful application that anthropological research on built heritage has been researching on touristic potential and economic potential. The cause of this lack of larger vision is the fact that these studies are defined by archeologists, who usually do not consider the heritage element as something livable, as is architecture, but just as an element of museum. To correctly apply anthropological methods one most research with the anthropologist fieldwork view, focusing on both the subject and the object.

Heritage studies are being affected with all these levels of interdisciplinary interaction, first from the sciences of sustainability, the engineering of energy, energy management and now anthropological research methods. A better understanding of the heritage conservation process is taking place. Still it is

\textsuperscript{114} David Pokotylo and Neil Guppy, "Public Opinion and Archaeological Heritage: Views from Outside the Profession," \textit{American Antiquity} 64, no. 3 (1999).
important to achieve a better interaction between science research and cultural elements. That is the objective of the present interpretative approach.

3.2 Proposed Approach.

This is a research on values and significance coming from the user and society and how they interact with principles of sustainability in heritage listed buildings. To be a feasible heritage assessment it is necessary to follow the correct pattern outlined in the first two chapters.

The first point to assess heritage values is to identify them and create a typology to work with, that typology will be a constant pattern during the research on each of the four churches of this research. The typology would include some sociocultural values outlined in Chapter 1. Instead of describing each value as a specialist, I will create a questionnaire containing the following subjects related to a building:

- Thermal comfort questions.
- Energy retrofitting interventions proposals.
- Personal valuation of the building.

I am not presenting my own evaluation of the artistical, historical and architectural values due to the fact that these buildings are already listed as heritage. I am taking some sociocultural values and present them as starting point for the assessment. The objective is to subjectively relate the result of the questions and anthropological interview observations with the following set of values:

- Age value.
- Architectural and artistic value.
- Emotional value.
- Historic value.
- Religious value.
- Political value.
- Educational value.
- Community value.
- Non-use economical value.
During the interviews, other values could arise and others could not appear in the opinion of the users, so as I already mentioned in Chapter 1, the values may be modified at the final statement of significance. Finally the presentation of a statement of significance and other general comments would try to fortify the assessed values.

The interview would be a general questionnaire. Differently from the methods of assessing thermal comfort I am applying the same interview for all the four churches, assuming that the similarities of region, religion, society and country give me the possibility of researching them with a unified questionnaire.

The previously reviewed methods of surveying do not see people’s reactions. Usually surveys are sent online or by mail. The institution or agencies consider a percentage of participation (few people answers the surveys and send them back). Usually there is not a contact between the researcher and the user. In the case of personal interviews, the contact between interviewer and the interviewee is limited to the very structured and strict survey. The interviewer receives training on how to ask and how to answer questions from the user, even which commentaries are to be avoided. In the case of the present research, a participatory method is a priority, establishing a direct relation of observation between the interviewer and the interviewee.

In the survey methodologies of BUS and LEED thermal comfort, the survey sheets are sent to all the possible users of the buildings, thousands in some cases. Both methodologies consider a minimum percentage of response so the sample would be considered valid. In the case of this research, the interviews are going to be applied to a group of key informants. Most of the informants are people that are related to the use of the building along the year. For each building studied the selection of the informants will be described according to the circumstances and possibilities in Chapter 4. For this research, street interviews are not included, mainly because the direct users are considered the best informants, but also because the interviewer needs to be in comfortable conversation with the interviewee, so he (I) could register their cultural response; also the nature of the interview requires the showing of images, which in a street interview would be highly inconvenient. Another important reason to choose informants is that this research focuses only on
values of the users, not on architectural fans or temporal visitors of the building (tourists).

The research method used is a partially structured interview with a flexible possibility to give the individual the capacity to respond without following a static procedure. The problem with strictly structured questionnaires is that people do not answer yes-or-no when their opinion or perception is enquired, but they tend to give complex answers with some complementing questions, to which the researcher could not know the right answer, the solution is to ask a question as a guideline and then get people to talk.\textsuperscript{115} The interviewer may have the possibility of solve questions in a more free way, remembering of not jeopardizing the question by forcing a response.

Some of the questions will be supported by the showing of an image that has the intention to generate a visual and emotional response on the interviewee, relating the image with the question and the individual values and opinions on the heritage building.

Questions have a direct objective and an indirect objective. The indirect objective is to stimulate response and opinion concerning possible energy-efficiency interventions. The people are subjected to an external influence by showing images of the intervention results or procedures. The task of the interviewer is to capture the direct response and the emotional complement response and series of reactions that come with the answer. For this reason the interview has to be face-to-face, because the submissions of surveys do not give insight of the people’s attitudes. Also, the interviewer should not directly inquire on the importance of energy efficiency and sustainability and avoid judging the interviewee on environmental consciousness, at the moment of the interview.

The selection of the use of anthropological-ethnological interview has been due to the fact that it allows a good insight of the user attitudes and values. On the other hand, a more professional oriented research hardly would shed light on real user opinion, specially since the specialist in sociocultural values in heritage

buildings take most of their knowledge from documented sources, not from the people.

“Architects and architecturally trained historians, as well as most conservation professionals, participate in a process of professional socialization that provides a common language, set of symbols, value structure, and code of rituals and taboos. The public does not share this perceptual system but, instead, holds images and preferences that are embedded in its own beliefs, customs, and values.”116

The interview and questionnaire explained below was created taking in consideration two handbooks of ethnological-anthropological research. The method of interview with participative observation is documented in both of them. These handbooks are: the Sage Handbook of Qualitative Research117 and the Bernard, H. Russell. Research Methods in Anthropology: Qualitative and Quantitative Approaches.118 The result of the consultation of those handbooks is the proposed questionnaire.

The reason to choose an ethnological-anthropological approach is that is one of the most empirical and observational possible methodologies in the humanities. As Bernard expressed: “Most anthropological data collection is done by fieldworkers who go out and stay out, watch and listen, take notes, and bring it all home. This makes anthropology a thoroughly empirical enterprise.”119 And also because of the possibilities to interpret and use the collected data, as Setha M. Low says: “Ethnographic research—the process of describing a culture—has the ability to predict local response to design and planning proposals accurately, and it can help evaluate complex alternatives through systematic cultural understanding.”120 Finally in the context of the use of data, E. Liebow says: “The process of ethnographic

116 Ibid., 35.
119 Ibid., 24.
research with culturally distinctive communities affected by construction projects can give a certain credibility to agency decision making.”

As a qualitative and humanist research, the interview will not produce qualitative data and the questions will not include technical information in numbers, to which whatever the users are usually unfamiliar. The main focus is on attitudes and observation of those attitudes. I will not produce the kind of measurable data that conservation technicians are used to, but an interpretative result of the “The basic humanistic methodology of research, interpretation, and writing a narrative account remains one of the most effective to construct and express knowledge about values.”

The fieldwork should generate a qualitative report of the data, derived from a series of interviews to the key informants with a standardized questionnaire. The interview is based on personal perceptions; therefore the questions will be in general multidimensional – answers may be governed by many possible variables – which is more difficult to measure for a quantitative report but more manageable to include in a qualitative interpretation. Also the feasibility of a quantitative presentation of the data would require a more representative sample, with a bigger quantity of informants, not only some key informants as in this research.

3.3 Interview and Questionnaire Structure.

In accordance to the methodological objectives already outlined, the interview was structured in three sections: thermal comfort, energy-efficiency interventions and personal valuation. The complete sheet of the questionnaire can be found in Appendix 3, at the end of this document. “The idea in structured interviewing is always the same: to control the input that triggers people’s responses so that their output can be reliably compared.” In this case the interview is partially structured because even when an interview sheet has been created and standardized, the free

123 Bernard, Research Methods in Anthropology: Qualitative and Quantitative Approaches, 251.
interaction of the participants is a paramount element. Additionally the interview should be registered in audio record for future reference and the interviewer should write comments on the user reactions and additions to the questions, fulfilling this way the anthropological observation.

The first section of the questionnaire, thermal comfort, is intended to investigate the perception of the experience of being inside the building while the climatic condition is cold and warm. It is divided in cold weather (Winter) and warm weather (Summer). The same questions are asked for each kind of weather.

There are three kinds of questions in the thermal comfort section. There are two questions with two possible answers, two questions of general perception and two questions that follow the comfort scale of seven levels highly used in other thermal comfort researches, the difference is that instead of enquiring on levels of satisfaction, these questions investigate on perception on hot and cold, being Very Cold=1 and Very Hot=7. Numeric values are not registered, I mention them here just for the sake of comparison. For further detail on the structure of the questions please refer to Annex 3.

The thermal comfort section includes a set of questions on the lightning, air and wind. Lightning as an indicator of energy performance from natural or artificial sources, air questions enquire on the efficiency of the air circulation and air quality inside the building, and wind investigates the possible thermal bridges that are perceptible by droughts inside the building during cold weather conditions.

While the users are answering each question, the researcher should pay attention to the elaborated answer, to identify elements of the sociocultural elements that may be affecting the user answer beyond the thermal comfort. The fact that the users have a close relationship with the building may be affecting their answering patterns, or not.

The second section of the questionnaire is devoted to present the possible energy-efficiency interventions that could be applied to the building and investigate how much the informant user would agree or would be opposed to each intervention. This section is entirely formed by questions following the “Liket Scale”,\textsuperscript{124} which consist on a five-level options answer that goes from Strongly Opposed to Strongly

\textsuperscript{124} Ibid., 328.
Agree. This could be the hardest part of the interview because the key informant could feel a big pressure to give a scaled opinion on technical matters.

The important part of the section on energy-efficiency interventions is the showing of the images; this would make the informant to think in the possibility of that kind of intervention to be applied to the building. It is important to explain the energy and thermal benefits of the intervention as they are explained in Chapter 2.

All the images from (Appendix 2. Figures) must be shown to the informant, one by one, after a short explanation of the benefit and consequence of the intervention. After the informant user is informed about the intervention and has seen the corresponding image, he should answer according to the level of agreement from the Likert Scale.

An example of the procedure to ask questions of the energy-efficiency section would be:

1. Prepare the first question: Would you agree with internal insulation to by applied to the church?
2. Explain what is internal wall insulation: Insulation is an internal cover for the walls that is applied by layers of different materials. Insulation retards heat transfer by radiation and therefore heat loss, making the internal heating systems more energy-efficient.
3. Explain the reason to intervene with an internal insulation of the walls: “walls can account for almost 35% of the entire building envelope’s heat loss”.
4. Present the image that explains the intervention: (Figure 5. Internal insulation layers).
5. Ask the question: Would you agree with internal insulation to by applied to the church?
6. Register the answer in the scale:
   a) Strongly agree
   b) Agree
   c) Neutral
   d) Opposed
   e) Strongly opposed
7. Observe and register additional information given by the informant.
The last section of the questionnaire is devoted to a personal valuation of the building. It has two questions that ask about the importance of the building for the user, grading importance in a scale of ten levels, being 10 “Very important” and 0 “Not important at all”. The next question is about if the person knows the history of the building; while it is not an answer to elaborate as it is limited to YES or NO, it is expected that the users will try to explain what they know about the building. The next three questions are designed so the informant can elaborate the answer and assign values freely. Finally the last question intends to discover if the interviewee considers non-use economical values for the building.
Chapter 4. Results and Analysis.

In this chapter I will explain how the designed interview was applied in the four heritage churches selected for the present study.

All the four churches are heritage-listed buildings under the protection of the “Old Groningen Churches Foundation”\textsuperscript{125}. A local committee of the village in which it lays supervises each one of them. The economical founds to keep them are administered by the Foundation, while the activities that are performed inside are administered by the local committee, with the exception of one of them which is under the authority of an organization named “Bijzondere Locaties Groningen” which rents historical buildings for events. Before visiting each church, I contacted the local committees or relevant users and coordinated a visit and interviews applications. I requested the presence of someone that would be in the knowledge of the use of the church so that person could answer me a preparatory questionnaire.

I applied a preparatory questionnaire (see Appendix 3) as a form of general information survey to the person in charge of the building, or the one with much closer relation to the usage or maintenance of the building. This preparatory questionnaire is intended to get some basic information about the building in relation which its use and energy usage. The resulted data would be related to the final analysis resulting from the interviews to the informants.

In all the cases, the key informants were interviewed one by one. In two of the cases the other informants were hearing the questionnaire at the same time, in one case each informant gave information totally separated, while in one case only one informant was available. I present the results for each church as a full description, even when they did not answer each question at the same time.

\textsuperscript{125} Stichting Oude Groninger Kerken (SOGK) translated Old Groningen Churches Foundation, was founded in 1969 with the objective to conserve the historical churches in the province of Groningen.
4.1 Nieuw Scheemda church.

The first church visited was the one located in Nieuw Scheemda. The sacristan of the church agreed to gather some villagers with him and meet me in the church for the interviews. The informants were himself, his wife and another woman; all three are part of the local committee that takes care of the church. Their age and professions are:

- Informant 1. Male, 62 years old - works at a supermarket.
- Informant 2. Female, 60 years old - nurse.
- Informant 3. Female, 47 years old - teacher in social sciences and Dutch language at middle level vocational training.

General information.

Location and history.

Nieuw Scheemda is a small village that is part of the municipality of Oldambt in the province of Groningen. Its coordinates are 53° 13′ N, 6° 57′ E.

The village of New Scheemda was born in 1659 as a parochial separation from Scheemda. The land of the village is part of a polder that was created at the end of the 16th Century by reclaiming land from the bay called Dollart. The Reformed Church of New Scheemda was built in 1661, as it is documented in the entrance of the church.

The organ in the church is also extremely relevant; it is considered one of the six organs practically unaltered that were made by the renowned organ builder Arp Schnitger that survive in the province of Groningen. The Nieuw-Scheemda organ itself dates back to 1695 but was given to the church in 1698. The organ was partially rebuilt in 1802 by Heinrich Hermann Freytag. It is said that it is the smallest organ ever built by Schnitger.

126 The person referred to himself as the koster - “sacristan” in Dutch.
127 Nieuw Scheemda - t'Waar Website, "The Villages," http://www.nieuwscheemda.nl/about/.
129 Nieuw Scheemda - t'Waar Website, "The Villages," http://www.nieuwscheemda.nl/about/.
The facade of the church was replaced and modernized in 1908 with two big windows that had the intention to imitate the typical Dutch countryside houses.\(^{130}\)

**Building description.**

It is a medium-sized church; the apse is located towards the East while the narthex and entrance towards the West. All the exterior walls are brick masonry while the interior walls are plastered. There are four large windows with equilateral arches on each North and South walls, together with two windows of smaller size on the apse wall and two blind windows of the same kind on the narthex wall.

In the interior, it is a simple church, highly symmetrical. The floor starts in a corridor of decorated clay and two wooden platforms that support the pews. The alter section floor is formed by clay and antique gravestones. (Figures 13 and 14)

In older photos can be seen that the heating system was for a time a stove in the centre of the church (Figure 15), which in the 1960’s was removed and a modern heating system was installed, presumably electric infrared radiation heaters from above the pews. Four units were installed, two on each sides of the nave. (Figure 16)

**Preparatory questionnaire.**

The preparatory questionnaire for the church of Nieuw Scheemda was answered by the 62 years old man who describes himself as the sacristan and who takes care of the church itself. He said that the building is used around five times a year. Four times a year is used for converts, that are usually held on Sundays afternoon; once a year the church is used for religious service, only on Christmas. The church used to be an active Calvinist church but as the religion has decreased in the Netherlands, this and many churches are being abandoned for religious services.

He said that the church usually hosts around 50 people per musical event and up to 70 people for Christmas service. The duration of the events goes from one hour and a half for Christmas service and two hours or more for concerts.

As for the installations, the church has a big boiler installed in the attic and the heat is distributed by a double wet system of convection sources; one being a

heated pipework that runs through the pews, behind each bench, providing heat directly to the feet (Figure 17); the other source are a small amount of modern wet convectors installed under two windows and the lobby (Figures 18 and 19). During winter months the system conserves a 10° C. Before an event on winter they have to turn up the heat from 12 hours in advanced to reach an 18° C.

The sacristan assures that during day there is no need of the artificial light and that enough light comes from the windows and that

**Interview Results.**

**Thermal comfort questions.**

All the three informants reported that the thermal comfort inside the church during a winter event is acceptable, while two of them considered that the perception of temperature was warm, informant 2 said that it was neutral, they kept their perception after half an hour of inactivity inside the church. Interestingly informants 1 and 3 reported that they would need to use only light winter clothes being inside, but the third reported that it is necessary to keep heavy winter clothes including heavy jacket and gloves while being inside. All of them said that the area of the gallery, where the organ is, feels warmer.

The Informant 1 appeared to dominate the opinion of the informants, forcing his opinion on the two women. He insisted that the church had a perfect thermal performance. He even said that for being an old church the conditions were excellent.

For warm climate conditions all of them approved the conditions as acceptable, while informant 2 described warm, informants 1 and 3 gave a neutral response, they all kept their opinion for being inside after half an hour. As they did for winter, they think that is warmer in the gallery during summer.

Even with little differences, all of them approved the conditions inside the building, with only informant 2 differing in the need to use heavy winter clothes while being inside during cold weather.

As for lightning all of them approved the illumination during night and day, but then again informant 2 said that cold draughts could be felt coming from North side windows.
Energy retrofitting interventions proposals.
Nieuw Sheemda informant’s reaction to possible interventions was a powerful opposition against almost all the possibilities presented, with only informant 2 agreeing with the internal double-glazing, but in all other presented possibilities the negativity in the answer was accompanied by a powerful reaction against most of interventions. Informants 1 and 3 agreed to radiant floor, while informant 2 opposed.

Personal valuation of the building.
The importance that the informants gave to the building was highly mixed, assigning more importance to the community than to themselves, also they expressed unaware of the history of the building.

They all considered that the organ and the atmosphere of peace are the most important elements that distinguish this church from others in the region, and considered the floor gravestones, the organ and the old bible as the most relevant items in the church.

They allocated no economic value to the church, with the exception of informant 3 who approved the continuing of the cultural events, but not in the benefit of the whole village.

Found values
- Age value. – Somewhat Important – All three informants talked about the church being old, they said that is one of the important facts.
- Architectural value. – Important – The informants valued the church as a beautiful building that dominated the landscape.
- Artistic value. – Not very important – The informants gave no importance to the art inside the church, even valued the sober character of the Calvinist churches. Only recognized some value on the gravestones of the floor.
- Emotional value. – Not important – They expressed no personal or community interest in the building, they do not feel a personal identification with this church in particular.
- Historic value. – Not Important – The informants do not know the history of the church beyond the foundational stone of the entrance.

- Religious value. – Very Important – The informants identify themselves with the Calvinist Christianity and expressed they disappointment with their society that has lost the faith. They would like the church to be used again as church but they recognize that there are not enough religious people to use it any more. At some extend their interest for keeping the church comes from a nostalgia of the lost religiosity.

- Political value. – Not important – They gave no political value to this building.

- Educational value. – Not important – They do not consider that this church could help in the education.

- Community value. – Somewhat important – The informants gave some value of the building to the community.

- Non-use economical value. – Not Important – The informants do not think that the church could bring any economical benefit additional to those that are already in practice.

- Acoustics. – Very Important – The main driver in the energy-efficiency interventions refusal was the fear of damaging the acoustics. They all showed proud of the church’s acoustics and they would be afraid of any intervention that could endanger it.

Final Balance.
The community defends this building under two principles: acoustics and religious nostalgia. Ironically the first one is the main reason to negate all possible interventions in the building, while the latter was expressed as the factor that makes the church useless. The informants coincided that no investment should be made on the church, especially for the reason that is not used as a church anymore. At some point they even mentioned that if were not for the acoustics the building should be demolished. That point results contradictory with the value of the place and the defense of the structure against any improvement.
In the case of all the possible interventions they said that no one should invest on a church that is no longer for religious purposes, therefore they reject any intervention even if they do not contribute with any money. They do not desire any investment larger than maintenance.

As for the importance of saving energy and under the mention of the percentages of energy that could be saved with the interventions, they expressed no interest in energy efficiency. They considered that the actual systems work well. Only informant 3 expressed a little concern for the importance of saving energy to the environment, but her rejection to energy efficiency was not modified by it.

Finally, they do not value the graveyard at all. When proposed the installation of solar panels on the roof, they instead suggested the removal of the gravestones outside to give room for the panels. In any case that was the sole intervention they agreed with.

4.2 Leegkerk church.
The second church visited was Leegkerk. Because of the vacation period all the members of the commission were on vacation, nevertheless it was possible to establish contact with voluntary personnel from Bijzondere Locaties Groningen, one of them agreed to meet. While being in the visit day, also another voluntary presented the interview. Each one was interviewed separately, so they did not make comments on the other response, as happened in Nieuw Scheemda. The info for the informants is the following:

- Informant 1. Male, 64 years old, pensioner, former teacher.
- Informant 2. Female, 67 years old, pensioner, former physiotherapist.

General information.

Location and history.
Leegkerk is an hamlet within the municipality of Groningen, the church has only two neighbour houses and the rest of the houses in the hamlet are sparse farms. Leegkerk coordinates are 53° 14’ N, 6° 29’E.
The original church was built during the Romanic period in the 13th Century. The South wall, the gallery and the tower are from the 18th Century. Specially relevant to its Gothic past are the piscina on the south wall and the small arched windows\(^{131}\)

The south wall was destroyed in a battle in 1514 when the Duke of Saxony invaded Frisia. Later the church was reconstructed and served as a school. Then the church was in very bad condition all of the 20th Century. The church was totally renovated, especially in the interior in 2013. The church used to have a door in the apse and to be heated with a center stove. (Figure 29)

**Building description.**

It is a middle-sized church, made with the typical brickworks from the region. The entire exterior is the brick is uncovered, while the interior is plaster from the recent renovation. The whole interior is modern and prepared to be an events place. The furniture is also modern and adaptable to the event. There is a separation in the middle of the church, a higher part with a big door. (Figures 20, 21 and 22)

**Preparatory questionnaire.**

Informant 1 answered the preparatory questions. He said that the church is used very often for events of all kind and every Sunday is open for visiting. Each event can host up to 90 people, but the average is 30. A normal event lasts 2 hours. The interior of the church is full of lights from many kinds and power outputs. The heating comes from a wet system with the boiler in the attic and wet radiators under the floor in the case of the half of the church in the apse area. The rest of the church receives heat from a radiant floor. During winter the church is kept at 10°C, and it is used effectively at 20°C. It is necessary to turn up the heat at least four hours before an even. Artificial light is used at any time; due to the small windows also during day the artificial light is desirable and used.

**Interview Results.**

**Thermal comfort questions.**

In the user evaluation of the thermal comfort, both of them approved the comfort inside the church during winter as acceptable, saying that the perception is that the temperature is neutral, but mentioned that after 30 minutes of inactivity the perception becomes a little cold. Even then they do not need to wear heavy winter clothes. Informant 1 considered that the lower area of the church is warmer, and he attributes it to the radiant floor. Informant 2 did not report an area with different perception of temperature.

During summer, the informants describe the thermal comfort as acceptable, but a little cold. Both of the informants agreed that after half an hour of inactivity, the perception enhances to cold. For summer they feel that temperature is the same as little cold all over the church.

As for the illumination both of the informants agreed that artificial light is necessary to do activities inside the church during the day. As for the air quality it is deemed satisfying.

They reported that cold draughts could be felt coming from both doors (North and South) and from the windows.

Finally they reported that the acoustics are acceptable to good, but not outstanding.

**Energy retrofitting interventions proposals.**

When presented on the possible interventions for energy retrofitting, the reaction of the two informants was highly mixed. Informant 2 would agree with the installation of internal insulation, while informant 1 would oppose. Both of them are strongly opposed to external insulation.

For internal double-glazing, informant 1 strongly agrees with the intervention but informant 2 is neutral. Both of them recognize that cold draughts could be improved with this kind of intervention. Both of them are opposed to external double-glazing.

Both informants showed little interest but not opposition to shading for obscuring the environment or to improve the thermal efficiency, they would approve mechanical curtains or shutters.

Informant 1 showed a greater interest in possible intervention, agreeing with a double door that could help to solve the thermal bridges of the doors and agreeing to
a radiant floor in the area of the apse. On the other hand, informant 2 do not wish to see any more interventions on this church and while she is neutral to the double door, she opposes to radiant floors and radiant walls. Both of them oppose to the installation of sources of clean sustainable energy, neither in the church nor in the surrounding area.

Personal valuation of the building.
The position on the personal valuation of the building changed was different. Because informant 1 is a passionate of history and art, he expressed that the church is very important to him, while informant 2 who is not that passionate of the past, said that the church is somewhat important to her, both gave a grade of 7 out of 10 to importance of the church for the community. Both informants consider that they know the history of the church.
Informant 1 valuates the church for being isolated, expresses simplicity in the design and has good acoustics. Informant 2 lives close to the church so she things that is good that she leaves nearby, that the church is recently intervened and looks new. Both of them agreed that the most important elements are the piscina, the gravestones on the floor and the niches that are in the apse (less common in other churches).
Informant 1 considers the historical relevance that the church was part of some battle and informant 2 recalls that a couple of her neighbours celebrated 25 years married in that church.
The informants do not consider that the church could get some economic benefit, and defend the idea that the money of the events is only for keeping the church in shape and working.

Found values
- Age value. – Important – The informants showed a big interest in the age of the church, they like that the structure is old even when the interior is not.
- Architectural value. – Somewhat important – The informants showed a little level of interest in the architecture, during the interview they noticed less elements of the structural conformation of the church.
- Aesthetical value. – Important – the informants like the exterior more than the interior; they would consider a physical change of the interior.

- Emotional value. – Not important – They did not expressed any powerful feeling towards the church, more than the admiration for the old building.

- Historic value. – Important – I can recall that informant 1 mentioned that the church was place of a battle that left it damage. Informant 2 did not report any interest fact in history. It seems that history is relevant but not too much.

- Religious value. – Not important – They showed not nostalgia or any kind of feeling towards the fact that the building was a place of worship.

- Community value. – Somewhat important – They considered that the building is an important element for the community; they mentioned that it holds relation with the nearby church of Hoogkerk.

- Non-use economical value. – Not important – Informants do not believe that there could be some economical profit from the use of the church.

Final Balance.
The informants at Leegkerk are pensioners with a higher educational level; they showed much more environmental consciousness as a reaction to the energy-efficiency proposals. They gave some time to think in each of the proposed solutions and gave an answer just after giving it some time to think about it and asking much more about the implications of each intervention. On the other hand they do not see a real need for improving the energy efficiency of the building. While they recognized the existence of some thermal bridges, they would prefer more discreet interventions. In this point maybe the application of some sealing in the windows and some other solutions for the doors would do.

For the summer conditions, the feeling of cold inside the church seems to be a major concern; both of the informants expressed the need to use long sleeves while being inside in summer.

Finally, the possible economical benefit appears as a negative; the informants as volunteers, have the chance of getting some money from cakes they sale there but they mentioned that they always have to take the cakes back home because not enough people go there to buy them. Among other situations, the church is located in
a country side road that is somewhat transited during summer but that may see its accessibility reduced with snowy weather.

For this church it seems that the informants would be in good disposition to see improvements in the thermal bridges but without greater interventions, also they do not consider that the heating system is necessarily out-dated but they would accept a partial improvement.

4.3 Lettelbert church.

The case of Lettelbert church presented a different opportunity, the one of interviewing real daily users of the building. Instead of getting in contact with the commission of the church, I was able to contact its more active users.

A Christian Orthodox man that gives lessons on painting orthodox icons uses the church as teaching workshop. He, his wife and students, that are constant user all the year around, were my informants for the study.

- Informant 1. Male, 58 years old, painter.
- Informant 2. Female, 53 years old, psychologist and filmmaker.
- Informant 3. Female, 74 years old, pensioner, former teacher for kids.
- Informant 4. Female, 62 years old, pensioner, former teacher for kids.

General information.

Location and history.

Lettelbert is a village that belongs to the municipality of Leek, in the province of Groningen. It has less than 200 inhabitants. Its coordinates are: 53° 11’ N, 6° 24’ E. The church of Lettelbert dates back from the 13th Century. When in the 17th Century the church became Protestant, the old altar was placed in the entrance so the people would step over the Catholic altar. The church was restored in 1985 and the altar was returned to its original place.132

**Building description.**

The building is a small church with the same orientation as the two previous mentioned (apse East, narthex West). It has only one door in the North façade (Figure 23). The West façade is clearly modern; it was rebuilt at the end of the 19\textsuperscript{th} Century (Figure 24). It has a small tower and the apse is rounded. Many windows have been blinded. The exterior walls are fully brickworks. The interior walls are generally plastered, the ceiling is blue as in the previous two churches studied and the pews are more compact. The floor is clay in the entrance and gravestones in the altar area. A pulpit dominates the apse. In the centre of the church it is an old stove that works as main heating system. (Figure 25)

**Preparatory questionnaire.**

The first informant answered the preparatory questions. He said that the church is used three times per week for icon painting classes and additionally is used occasionally for events and very rarely for religious services. The painting classes could host up to 15 students, usually they use only the kitchen in the back part of the church (Figure 26). The main church lacks illumination so the students use little office lamps when they seat on the benches. The heating in the main church comes from an old stove in the centre of the nave. The classroom is heated with an electric radiator and an electric one with oil. During winter the church is not heated and only the electric devices in the classroom are turned on one hour before class starts.

**Interview Results.**

**Thermal comfort questions.**

During winter, the users reported the church in an interested manner. Informants 1 and 3 described the thermal comfort as unacceptable; informants 2 and 4 said that it is acceptable in the classroom area but unacceptable in the church area. As for the thermal perception, Informant 1 said that it is cold; informant 2 that is a little cold; informant 3 said very cold and informant 4 pointed neutral. All of them with the exception of informant 4 kept their perception of temperature after half an hour of inactivity; informant 4 passed from neutral perception to cold.
All of them said that they might need to wear heavy winter clothes while being inside.

For the summer conditions all of them described the thermal comfort as acceptable and the perception as neutral, keeping the perception after half an hour of inactivity. All of them considered that the amount of light that enters into the church during the day is enough, but in the night moves from good to regular in informants 1 and 4, while informants 2 and 3 never have been in the church when is dark. All of them considered that the quality of air is satisfying but also recognized the presence of cold draughts inside the main church during winter, and from the church coming into the classroom.

**Energy retrofitting interventions proposals.**

Giving the conditions in which the church performs in winter it was to be expected that everyone would agree with strong measure to improve the thermal comfort inside the building, nevertheless the answer was mixed.

For internal insulation, informants 1 and 4 agreed to the intervention, informant 2 strongly opposed and informant 3 expressed neutrality. For the external insulation the first three informants were strongly opposed but informant 4 agreed with it.

For internal double-glazing, all the informants agreed and expressed neutrality for the external glazing.

The intervention of installing an insulated lobby resulted in a unanimous opposition. On the other hand an also unanimous decision agreed to the radiant floor. Half of the informants agreed to radiant walls and the rest opposed.

In the case of generation of energy, everyone agreed with the condition that it would be installed only in the graveyard but not on the church.

**Personal valuation of the building.**

Interestingly in the case of Lettelbert, all the informants expressed that the building is extremely important for them and for the community. All of them consider that they know the history of the church and are interested in knowing more about it. They gave special importance to the age and the atmosphere of the church and to the pulpit and the altar stone.
The church is a very important meeting point for the community; they feel an attachment to it through the painting classes and the exhibitions by students. Finally, they recognized that the church has the potential to give economic benefit to the community and the village. The painting school is attracting foreign students that pay the villagers for a place to stay and that have been generating income.

**Found values**

- **Age value.** – Very important – Age was reported as one of the main factors of valuation for the users.
- **Architectural value.** – Not important – The informants showed interest in history and tranquillity but not in the building as work itself.
- **Aesthetical value.** – Important – The image of sober mysticism and the internal decoration are important elements for the users.
- **Emotional value.** – Very important – This community is very much attached to the building as a result of the many years of the painting classes in that site.
- **Historic value.** – Important – The users are interested in knowing more about the church, like the original consecration, that they have not been able to find in sources.
- **Religious value.** – Not important – Although not important as a site of cult the church is important for them in the following value:
  - **Spiritual value** – Very important – The community identified the creation of religious icons to be in harmony with a religious place. They use the acoustics of the place to play orthodox vocal music while they paint. This is one of the main values to consider for this church
- **Community value.** – Very important – This community has become very well linked, even coming from farther cities to paint and share in this building.
- **Non-use economical value.** – Very important – Informants and villagers know about the value of the church as an asset to attract income occasionally.

**Final Balance.**
Lettelbert church presents a grave problem of outdated technology, a church that was renovated in a strictly aesthetical way but with no improvements in the energy-efficiency. Of course at the time of the renovation, 1995, these technologies were under develop and the concepts of sustainability and environmentalism were not yet rooted amongst the conservation professionals of the time.

It is clear that the church is valued as a spiritual place for gathering under the auspicious of the painting classes. The desire of the community for keep using the church does not see affected by the fact that the climatic conditions in winter are unpleasant, but exists the feeling that conditions could be better. In that sense, informants revealed that during winter they have to struggle with the two devices inside the classroom, while trying to avoid the cold coming from the church to the classroom.

The paint teacher expressed the desire to transform the whole church in a classroom, to make place to the main church to be used as a bigger classroom and having the possibility to dispose of the pews and benches. He even desires to create and install an iconostasis with the works of the students, this in order to give a greater atmosphere of orthodox spirituality during the lessons. For those conversions he would like to receive the support of the commission, but he knows that the energy retrofitting of the church is fundamental, and also the updating of the heating system, the major problem in this church.

4.4 Obergum church.

The last church visited was Obergum church, in the town of Winsum. For this church it was possible to contact only one member of the commission, who is also the chairman of that commission. All other members and users were on vacation and therefore only the chairman was able to answer the questionnaire.

- Informant. Male, 64 years old, pensioner, former therapist. Chairman of the local committee.

General information.

Location and history.
Obergum was originally a village next to Winsum, nowadays they are part of the same town. Winsum had its own church and this one is the one of the former independent village of Obergum.

The church is located on a mound, built in the Middle Age to keep the church dry during floods. The building is not longer visible from the street because houses and other buildings have enclosed it. The church was built in the 13<sup>th</sup> Century and later in the 15<sup>th</sup> Century it was extended and the tower and clock were added in the 17<sup>th</sup> Century. The church was originally consecrated to Saint Nicholas. Obergum church was the first church to be restored by the Old Groningen Churches Foundation. The intervention of restoration was finished in 1969, since then no other major restoration has taken place. (Figures 27 and 28)

**Building description.**

This is a middle-sized church, the exterior is brickwork masonry and the interior is an old form of plaster. The tower is also made of bricks and finished in a two waters roof (in contrast with the little towers with spires of the other three churches.) The windows have many different sizes and styles, ranging from very small ones to big arched windows. The entrance to the church is by a little lobby in the South side of the tower, the tower itself is in the place of the narthex.

**Preparatory questionnaire.**

The church is currently being used very often, around 50 times a year for different uses: marriages, funerals, parties, religious services, social events, concerts and music festivals. Each even can host up to 130 people but the average is 20 people. The minimum rent period is 4 hours but some events could hold the church for 2 or 3 days. The lightning is poor inside, only 8 old lamps hold from the ceiling, so additional illumination is usually installed for the events.

Before each event in winter the church needs to be heated for at least one hour before to reach 18° C and the temperature would fall rapidly after it is turned off or reduced to the maintenance temperature of 12° C.

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The heating system is a wet system with a boiler in the attic; the radiators are all of them skirting heaters located in the interior perimeter of the church. (Figure 30)

Interview Results.

**Thermal comfort questions.**

For the thermal comfort in winter, the informant reported that he consider it unacceptable for comfortable activities. He said that his perception of the temperature is little cold, which remains in the same description after half an hour of inactivity. The use of a jacket is needed while being inside. The opinion was that in winter the church is cold and a lot of energy is needed to keep it that way, the heating system has to work at maximum power all the time that the heat is needed.

For summer time, the informant reported that the thermal comfort is also unacceptable, yet his perception is that the temperature feels neutral and becomes a little cold after half an hour. Also he mentioned that the church would never become overheated during summer and that even the temperature inside would remain cool while outside is warm.

The informant reported that the air quality is bad and with some bad smell, he also reported thermal bridges in all the windows and the door.

Differently to the other churches, Obergum was reported to have bad acoustics: the sound produces echo.

**Energy retrofitting interventions proposals.**

For the possible interventions, the informer is strongly opposed to both kinds of insulation; he argues that he prefers to keep the historical authenticity. He strongly agrees with internal double-glazing as a way to solve the thermal bridges of the windows; he opposes to the other forms of glazing. Also he would agree with screening and shutters for the windows.

The idea of the glass double lobby caused him great interest and he would be strongly agree with it and also with the radiant floors, as for the radiant walls he would accept only if the interior details are respected.

This informer is the only one that would agree with photovoltaic cell on the roof.
Personal valuation of the building.

According to the informant, his personal valuation of the church is that the building is very important for the community and somewhat important for hum. He considers that he knows the history of the church and thinks that the church is special because is bigger than others and houses much more activities than others. For him, the cave beneath the church and the outside facades are the most important elements. Finally he would not like that the church would generate an income, just enough money to keep the building in use and good shape.

Found values

- Age value. – Somewhat Important – For the informant age is not one of the main elements of the church, the present activities are more important.
- Architectural value. – Very important – The church creates him a sense of admiration, architectural elements were expressed as the important ones.
- Aesthetical value. – Important – Linked to the architectural value but not that deep, he did not presented an admiration of the aesthetics of the church inside or outside.
- Authenticity. – Very important – For the informant, keeping the authenticity untouched is the priority.
- Emotional value. – Not important – He did not express emotional attachment to the church.
- Historic value. – Somewhat Important – The informant never mentioned elements of the history of the church but is conscious that it is old and valuable for that.
- Religious value. – Not important – For him, religion is not important and the church should not be used as church any more.
- Community value. – Very important – The informant brands the church as an active meeting point and reference for the community.
- Non-use economical value. – Not important – There is not a desire to exploit the economical benefits of the church.

Final Balance.
For Obergum church, the intervention for energy-efficiency is already programmed and it is also highly needed. The church looks now old and the conditions are not comfortable. The heating system should be update because, as the informant told me, it is necessary to take the boiler to max power to heat it updating winter. The historical photos of the church showed that the internal plaster dates back to the restoration of 1969, yet the informant do not wants the plaster to be removed for some interventions, like thermal insulation. Apparently the church has a good potential to generate income; it is located in an important town in the area with easy access from the capital city of Groningen. Unfortunately the informant opposed to the idea of using the church as a source of income.

4.5 General analysis.

The four churches analysed presented different point of view and relationships of the informants with the buildings. In Nieuw Scheemda, the interview was answered by 3 out of 5 members of the committee; in Leegkerk there were 2 volunteers; in Lettelbert 4 users were the informants and in Obergum was the chairman of the local commission.

The mixture in the conformation of the informants allowed me to test the interview model in different kinds of users, and not only on stakeholders. Different attitudes towards the interventions and the energy-efficiency measures can be seen.

In the case of the churches where the informants were stakeholders, Nieuw Scheemda and Obergum, it appeared that the interview was answered following a group agenda instead of personal values. In both cases, the informants had a more official point of view of the possible actions on their churches, together with an apparent desire to defend the – somewhat mistaken – authenticity of the church. In the case of Nieuw Scheemda, the informants took a defensive position and they were worried that the present thesis could have a negative impact on the church. In many cases I was forced to repeat that the interview was only with academic purposes and not as a pre-evaluation of a project in process, also they were very perceptive of the economical costs that the proposed interventions could imply, even when they do not
pay for conservation procedures in the church. The committee in Nieuw Scheemda defended their church as a perfection that could not be improved any further, and any investment on it would be a loss of money. Following the fact that the church is not used that often, maybe they are right.

In Obergum, the sole informant also defended the authenticity of the church and rejected possible intervention on the wall, even when the conditions of the church and the frequent use are clear symptoms that conservative action on energy-efficiency is an urgent course of action.

Even when not stakeholders, the informant-users of Lettelbert, have a greater attachment to the church than the one that many stakeholders could have. The church as painting school has become an important element in their community identity and emotions. They are highly conscious that thermal improvements would also improve their class experience and comfort. Perhaps, Lettelbert and Obergum are the two churches, which for their frequency of use require the most attention for thermal upgrading.

Leegkerk is a building that was renovated recently, therefore a major intervention does not seems likely or convenient to this point. As the informants pointed, solving the thermal bridges on windows and doors would be the more sustainable and logic course of action for Leegkerk.

Talking about people’s environmental consciousness, it was clear that the more educated people showed a greater concern on the advantages of saving energy, while the less educated were not interested on the environmental consequences at all.

Finally I think is important to consider the age of the informants, being third-aged most of them, is understandable that the resistance to change is rooted in the normal conservative attitudes of older generations.

Conclusions and Recommendations.

The inclusion of thermal comfort and energy efficiency elements into assessments of sociocultural values seems to be a possibility to exercise previous an energy-efficiency intervention. The use of interviews with stakeholders and active users are
an efficient tool for data collection. The resulted data could be analysed by many different perspectives; in this study I used an interpretative one.

After an introduction to the elements of the assessments of significance and the typologies of values, I presented some of the existing energy-efficiency interventions and considerations to improve thermal comfort and sustainability in historic buildings. Armed with that information, I proposed a typology to assess the relevance and the significance of possible interventions and how to work the values with users and stakeholder that are part of the society. Both users and stakeholders served as key informants to test a semi structured interview chart that looked for elements of thermal comfort, energy-efficiency and cultural conceptions to investigate social values and personal attitudes. The interview was applied in four churches in the province of Groningen and the results elaborated a systematic enunciation of values and identification of values of sustainability.

It was interesting to take churches as specific cases; more interesting to assess churches in the Netherlands. In a secular state, churches are evaluated in their artistic and architectural value, not in its liturgical value. In the case of the Netherlands, more and more churches are becoming social building and are abandoning their religious purpose, this as a consequence of the phenomenon of the increasing atheism of the country. Surely the assessing of churches in more religious countries would have other consequences.

I tried to register some elements of the mentality of users and stakeholders, especially their reaction to the influence that the photographs of energy-efficiency interventions cause them. It is uncommon that those reactions to be documented or registered during the process of planning interventions of architectural conservation. Usually the meetings with the stakeholders (as part of the process of consultation) and the conservation professionals develop in an ambient of presentation to the public and debate as group, giving therefor e little space to the expression of the emotions. Also the work with social elements of the decision-making process is left to secondary stage of the conservation projects. In the case of my approach, I am proposing to include user and society stakeholders into the assessments of significance from the first moment.

76
It appears that for the informants, the valuation of the building is going towards the architectural and authenticity before the use of the building. In many cases, even when recognizing the need of thermal improvements, informants did not agree to subject the building to interventions that could jeopardize what they conserve as the true value of the church, that is its current state. Energy-efficiency interventions are seen with an important weight of negation, probably not realizing that modern technological interventions can be also aesthetically attractive.

While the opinion of the users are being taken into consideration for the interventions in conservation and energy-efficiency, the reality is that the assessments of significance are still mostly limited to the experts, or to the expert after analysing data resulted of the consultation with the society. This measure is probably for the best, so as we saw in the result of this research, the users and societal stakeholders are not always in the knowledge of the processes and technologies.

The use of the ethnological-anthropological method was partially successful, mostly because of the limitation of the deadlines and available informants. The research was some kind of rapid assessment with only one individual participating. I think a more precise description and definition of values can be generated with the proposed approach, if the time and resources are bigger.

The anthropological work on users of heritage-listed buildings seems a little unlikely to be integrated into traditional heritage assessments in the near future. On the other hand, assessments that include thermal comfort should definitely include the social and personal attitude of the users. Users can give a very good understanding of which interventions for thermal performance are relevant on which buildings. On the other hand, it seems that users have a low understanding of the relevance of the energy-efficiency; hypothetically they may be so much used to abundance that they do not consider that measures of sustainability as valuable.

Apart from the use of the assessed element, this research could give information to some policy-makers, depending on what they would look to achieve in the balance between heritage conservation, energy-efficiency and sustainability. Policies more users oriented would give good value to this kind of research, while those more professional oriented could also use it as a confirmation tool.
Limitations and opportunities.
With this research I tried to present a way to collect and conceptualize social data relevant to sustainability and energy-efficiency problems. There would be other forms of collecting the date and presenting it. For instance there can be done phenomenological interviews, which are in close relation with my proposed approach; sociological interviews and surveys can also be done. For the part of the data and the interpretation, I think there is a very good possibility to use a similar kind of research to generate measurable data and therefore create a quantitative study with elements of statistics. For the case of the qualitative data processed in the present study, descriptive statistics could be use, especially if we were to have much of a sample of population.

For the present thesis, a small sample was used. An extension of the study with more churches and more informants – hopefully also more time – would necessarily generate a much more relevant sample. Times, deadlines and resources did not allow a larger study but at least it could be used as an example of how to work with the approach and how the interpretation could help to the assessments.

Recommendations for sustainability.
This research showed that there is a lot of work that can be done with the population in order to incentivize measures that promote sustainability. It is necessary to work with the users, villages and committees to orient them on the benefits of energy-efficiency and thermal comfort improvements. Especially for the building in more constant use, it would be useful to intervene them; the conservative mentality of the users could jeopardize those efforts. Also it is important to take into account the opinion of the real user, even more than the one of the committee or the stakeholders: someone that uses the building constantly, knows more of it than those who rent it or maintain it.

According to the informants, the churches studied are sustainable in economy; they can maintain themselves with the events. Even if that is totally true, it would be even better to generate a greater profit from the churches, not only by doing events, the touristic potential has not been exploited.
Increasing the presence of younger people, both in committees and in user groups to consult would be an important element to look forward to. The injection of new ideas and attitudes into the heritage conservation could help to the conservation and constant use of the buildings.

**Considerations for future research.**

In the case of the present thesis, a large theoretical explanation was apparently needed. At the end a balance was reached between the theoretical and the empirical information. For future research would be much more useful to develop a larger empirical section and limit the theoretical introductions.

Using methods taken from socio-psychological empirical observations could perfect the method I used. The ethno-anthropological research element could be maintained with more resources and researchers. One important example is the methodology called “participatory rapid assessments” in ethnology and anthropology, which are currently being used in heritage studies related to urban parks, urban heritage and landscape studies.\(^{134}\) Those kinds of studies are researching the user attitudes to historic public places; therefore a similar methodology could be used for the case of heritage buildings.

On the side of the architectural theory, my approach and existing methods are also close to researches on architectural phenomenology,\(^{135}\) which despite being considered out-dated from design studies, phenomenology still can be used to help research user experience in existing buildings.

Taken from literature studies, theories of reception are currently being applied to the study of historical architecture, especially in subjects related to aesthetics. I think that reception can also be studied on thermal comfort and attitudes towards sustainability, with approaches similar to mine. For my future research I would try to include a historical analysis on reception of energy-efficient and sustainable design, together with the empirical approach outlined here.


\(^{135}\) Phenomenology in architecture is the consideration of the sensorial experience related to the built environment.
List of Sources.


Low, Setha M. "Anthropological-Ethnographic Methods for the Assessment of Cultural Values in Heritage Conservation." In *Assessing the Values of*


### Table 1. Relevant Typologies of Values.

<table>
<thead>
<tr>
<th>Sociocultural Values</th>
<th>Economic Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical</td>
<td>Use (market) value</td>
</tr>
<tr>
<td>Cultural/symbolic</td>
<td>Nonuse (nonmarket) value</td>
</tr>
<tr>
<td>Social</td>
<td>Existence</td>
</tr>
<tr>
<td>Spiritual/religious</td>
<td>Option</td>
</tr>
<tr>
<td>Aesthetic</td>
<td>Bequest</td>
</tr>
</tbody>
</table>

Table 2. Sociocultural values and economic values.

Appendix 2. Figures.

Figure 1. Window shutters.
Figure 2. External secondary glazing.

Figure 3. Sectioned internal glazing.

Figure 4. Sliding internal glazing installation.
Source: https://clearviewsg.files.wordpress.com/2014/02/cv-ecclesiastic-crookes-methodist-fitting-colour-frame-mullion-classic-horizontal-slider.jpg
Figure 5. Internal insulation layers.

Source: http://www.greenspec.co.uk/images/web/refurb/internalwall/insulation-direct85.png
Figure 6. External insulation detail.

Figure 7. Glass internal lobby.

Source:
http://www.ionglass.co.uk/review_sh.php?src=shopimages/sections/extras/St%20Leonard%27s%20Church,%20Hythe%20bespoke%20structure%20and%20glass%20doors.jpg&w=800&q=90&zc=1,
Figure 8. Floor heating layers.

Source: http://heatmat.co.uk/product-range/details/different-floor-construction-options.html
Figure 9. Wall radiant heating system.

Source: http://greenhomedesignarchitect.blogspot.nl/2009/05/radiant-heating-systems.html
Figure 10. Photovoltaic cells.
Figure 11. Photovoltaic cells in panel on a roof.

Source: http://astonishingsecrets.tumblr.com/page/
Figure 12. Discreet photovoltaic cells on a roof.

Note that the cells imitate the roof design.  Source: http://www.greenerideal.com/tag/solar-panels/page/3/
Figure 13. Nieuw Scheemda Church.

Source: photo by the author.
Figure 14. Nieuw Scheemda, interior.

Source: photo by the author.
Figure 15. Nieuw Scheemda, interior, before 1960.

Source: Media Library of the Stichting Oude Groninger Kerken, Nieuw Scheemda folder 1
Figure 16. Nieuw Scheemda, interior, after 1960.
Image illustrates the installation of infrared heaters above the pews.
Source: Media Library of the Stichting Oude Groninger Kerken, Nieuw Scheemda folder 1
Figure 17. Heated pipework of the wet system in Nieuw Scheemda church.

Source: photo by the author.
Figure 18. Nieuw Scheemda lobby and wet heater.

Source: photo by the author.
Figure 19. Wet convector under a window, Nieuw Scheemda.

Source: photo by the author.
Figure 20. Leegkerk North wall.

Source: photo by the author.
Figure 21. Leegkerk, interior during an event.

Source: http://www.blgroningen.nl/locaties/de-kerk-van-leegkerk/
Figure 22. Leegker interior from the apse.

Source: http://www.blgroningen.nl/locaties/de-kerk-van-leegkerk/
Figure 23. Lettelbert church

Source: photo by the author.
Figure 24. Lettelbert west wall, rebuilt in 1890.

Source: photo by the author.
Figure 25. Lettelbert, interior from the choir gallery.

Note the stove at the centre of the church. Source: photo by the author.
Figure 26. Lettelbert, kitchen transformed in classroom.

Note the electric heater at the right and the oil electric radiator under the table. Source: photo by the author.
Figure 27. Obergum church, 1940’s

Source: Media Library of the Stichting Oude Groninger Kerken, Obergum, folder 1
Figure 28. Obergum church before the 1969 renovation.

Source: Media Library of the Stichting Oude Groninger Kerken, Obergum, folder 1
Figure 29. Leegkerk church interior before renovation.

Source: Media Library of the Stichting Oude Groninger Kerken, Leegkerk folder.
Figure 30. Obergum church interior to the apse.

Note the skirting heaters all over the perimeter. Source: photo by the author.
Appendix 3. Interview sheet and preparatory questionnaire.

Key informant questionnaire. (Interview sheet)

Info.
Church:
Name:
Gender:
Age:
Occupation:

Questions.

Thermal Comfort
Instruction: Take a moment to think that you are inside the church during a service or event; remember how you perceive the temperature and air when you are inside. Select and Answer to the following questions thinking in that perception.

Cold Weather- December to February.

Is the thermal comfort inside the church during a winter event?
 a. Acceptable
 b. Unacceptable

Which perception of temperature do you have when you enter the church in winter?
 a. Very Hot
 b. Hot
 c. Warm
 d. Neutral
 e. Little Cold
 f. Cold
 g. Very Cold

Being inside the church during an event in winter, how do you perceive the temperature after half an hour?
 a. Very Hot
 b. Hot
 c. Warm
 d. Neutral
 e. Little Cold
 f. Cold
 g. Very Cold

Do you need to wear heavy winter clothes during an event in winter?
 a. Yes
 b. No
There is an area of the building that you feel warmer than the rest of the building during winter?
   a. Organ
   b. Entrance
   c. Main church
   d. Other________

It could happen that the church become too hot during a winter event?
   a. Yes
   b. No

In case of overheating, how they solve it? (select one or more)
   a. Opening the door.
   b. Opening windows
   c. Turning off the heating
   d. Reducing the heating system temperature
   e. No especial action
   f. Other________

Warm Weather- Summer days.

Is the thermal comfort inside the church during a summer event?
   a. Acceptable
   b. Unacceptable

Which perception of temperature do you have when you enter the church in summer?
   a. Very Hot
   b. Hot
   c. Warm
   d. Neutral
   e. Little Cold
   f. Cold
   g. Very Cold

Being inside the church during an event in summer, how do you perceive the temperature after half an hour?
   a. Very Hot
   b. Hot
   c. Warm
   d. Neutral
   e. Little Cold
   f. Cold
   g. Very Cold

There is an area of the building that you feel warmer than the rest of the building during summer?
   a. Organ
b. Entrance
  c. Main church
  d. Other ________

It could happen that the church becomes too hot during a summer event?
  a. Yes
  b. No

In case of overheating, how they solve it? (Select one or more)
  a. Opening the door.
  b. Opening windows
  c. No especial action
  d. Other ________

**Lightning, ventilation and wind.**

How do you consider lighting during day?
  a. Good
  b. Regular
  c. Bad
Why?

How do you consider lighting during the night?
  a. Good
  b. Regular
  c. Bad
Why?

How do you perceive the air quality inside the church when is in use during winter?
  a. Satisfying
  b. Dissatisfying
Why?

How do you perceive the air quality inside the church when is in use in summer?
  a. Satisfying
  b. Dissatisfying
Why?

Can you perceive cold droughts inside the building during winter?
  a. Yes
  b. No
How and from where?
Describe how you perceive the acoustics inside the building during and event.

**Energy-efficiency interventions.**

Instruction: The interviewer will present different interventions that could be applied to the church in order to increase its energy efficiency and thermal comfort. Please consider the question and the possible answers after the explanation of each possible intervention.

**Internal or External insulation.**

Would you agree with internal insulation to be applied to the church?

a. Strongly agree  
b. Agree  
c. Neutral  
d. Opposed  
e. Strongly opposed

Would you agree with external insulation to be applied to the church?

a. Strongly agree  
b. Agree  
c. Neutral  
d. Opposed  
e. Strongly opposed

**Windows- Double-glazing.**

Would you agree with *internal* double-glazing to be applied to the church windows?

a. Strongly agree  
b. Agree  
c. Neutral  
d. Opposed  
e. Strongly opposed

Would you agree with *external* double-glazing to be applied to the church windows?

a. Strongly agree  
b. Agree  
c. Neutral  
d. Opposed  
e. Strongly opposed
Would you agree with replacing the church windows to install modern PVC glazing?
    a. Strongly agree
    b. Agree
    c. Neutral
    d. Opposed
    e. Strongly opposed.

Shading and screening.
Would you agree with screening the windows in order to create shade or darkness during the day?
    a. Strongly agree
    b. Agree
    c. Neutral
    d. Opposed
    e. Strongly opposed.

Which system of agreeing with screening, what kind do you propose:
    a. Mechanical shades.
    b. Electrical shades.
    c. Wooden tables.
    d. Other ___________

Door.
Would you agree with the installation of an entrance double door?
    a. Strongly agree
    b. Agree
    c. Neutral
    d. Opposed
    e. Strongly opposed.

Under-floor or in-wall heating.
Would you agree with the installation under floor heating?
    a. Strongly agree
    b. Agree
    c. Neutral
    d. Opposed
    e. Strongly opposed.

Would you agree with the installation of in-wall heating?
    a. Strongly agree
    b. Agree
    c. Neutral
    d. Opposed
    e. Strongly opposed.
Energy production.
Would you agree with the installation of clean energy generators like photovoltaic, biomass, or solar thermal energy within the church grounds? And where?
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Opposed
   e. Strongly opposed.

Personal valuation.
In your opinion how important is the church building for you? Being 10 “Very important” and 0 “not important at all”.

In your opinion how important is the church building for the community? Being 10 “Very important” and 0 “not important at all”.

Do you consider that you know the history of the church?

What distinguishes this church from the others?

Which three elements are important in this church?

Do you know any community memories of this church?

Do you think the church could benefit economically to the village/community? If yes, how?
Preparatory Questionnaire.

Church:

Name:
Gender:
Age:
Occupation:
Relation or charge to the church:

Questions.

When is the church used? How often?

How many people per event use the church?

How long the event lasts averagely?

What type of heating system does the church have?

The heating is turned on how long before the event?

Is the church permanently heated during winter?

Is artificial light used during day events?