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# The CORPUS Research Agenda for Sustainable Housing in Europe

CORPUS – Enhancing the Connectivity between Research and Policy-making in Sustainable Consumption

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## Table of Contents

1	Introduction .....	1
2	Objectives and scope of the research agenda on sustainable housing .....	3
2.1	Strategic objectives of the research agenda .....	3
2.2	Process and development of the research agenda .....	3
3	Themes of research in sustainable housing .....	4
3.1	Social issues and behavioural aspects .....	5
3.2	Planning and the policy's viewpoint .....	6
3.3	Assessment and decision tools for sustainable housing.....	7
3.4	Energy and technology .....	8



# 1 Introduction

Housing<sup>1</sup> is among the top priorities in making current consumption and production patterns more sustainable. Therefore, housing is a major issue in the politics of sustainable consumption and production (SCP), because of its impact on the environment, on health and on social cohesion. The environmental impact of housing is supposed to account for approximately one third of the average citizens' total environmental impact, mainly because of direct consumption of energy. If we are attempting to *green* current consumption patterns, different aspects of housing have to be addressed:

- Buildings account for approximately 40% of energy use and emissions, making energy issues a focal point of sustainable housing policies;
- At present, it appears to be both technically and socially easier to save domestic energy without negative impact on standards of living, than for energy use linked to food and mobility;
- Even if the environmental issues dominate questions of sustainability, and energy issues in turn dominate the environmental issues, Member States' policies do address social issues, economic issues as well as the wider environmental issues.

Unsurprisingly, sustainable housing is not only confined to the environmental aspect; it concerns very intensively also the economic and the social sides of sustainability. For instance, in the domain of housing policies, sustainability issues include urban poverty, housing for young people, and housing of immigrant populations, etc. – in short, policies for providing suitable dwellings for vulnerable groups. Furthermore, sustainable housing policies are supposed to contribute to creating more attractive and safer neighbourhoods; with less crime and unrest, better educational and cultural facilities and so on. In a north-south perspective, the social aspects of sustainability would typically cover social justice, inequality, access to health services and to education, fair trade, protection of indigenous cultures, even democracy and freedom of speech.

Sustainable housing covers a wide range of themes, policy areas, and area specific approaches. Therefore, the theme “sustainable housing” is a very diffuse object of policy, and in most countries responsibilities are likely to be shared between ministries (environmental ministries, social ministries, energy ministries etc.) as well as between levels of government (European, national, municipal).

As housing is a major issue in the politics of sustainable consumption and production (SCP) debate, it appears necessary to engage even more thoroughly in strengthening research in sustainable housing. With this in mind, the project CORPUS developed a new research agenda on sustainable housing, representing the joint efforts of researchers and policy-makers who participated in the project's activities.

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<sup>1</sup> Most of this introduction is adapted from the discussion papers written by Pal Strandbakken, Nina Heidenstrøm, Marit Vestvik (all National Institute for Consumer Research, SIFO, Norway) and Francois Jégou (Strategic Design Scenarios, Belgium) for the CORPUS workshops. Please go to the CORPUS website for more details: <http://www.scp-knowledge.eu/og/housing-group>

Starting in January 2010, the project “*CORPUS: Enhancing the Connectivity between Research and Policy-making in Sustainable Consumption*”, funded by the European Commission within FP7, has been working on and testing novel ways of knowledge brokerage between researchers and policy-makers, in three domains of **sustainable consumption** (food, mobility, housing), in order to enhance evidence-based policy-making and to develop a policy-led research approach.

On sustainable housing, the project consortium organised three workshops, each with an audience of more than 40 experts from all over Europe, where current trends, policy instruments and possible future scenarios were comprehensibly discussed and developed. With a total number of about 120 workshop participants on sustainable housing and more than 800 registered users on the project’s web-platform (<http://www.scp-knowledge.eu>), the CORPUS project has already established a broad community.

Extensive work and joint efforts have undergone the formulation of this Research Agenda (RA). Consortium partners, registered users, workshop participants, interviewed researchers and policy-makers have all cooperated in shaping a joint research agenda on Sustainable housing. Effectively, more than 100 people all over Europe have been actively engaged in the development of the Research Agenda, combining different professional and disciplinary backgrounds. As a result, this Research Agenda represents a joint effort in setting priorities and uncovering challenges in sustainable housing.

The main objective of the research agenda is to strategically and comprehensively set the stage of research in sustainable housing for the coming years, with the goal of advancing towards more sustainable consumption. Both the scope of the research agenda and of the CORPUS project are within the domain of sustainable consumption. Even though many issues regarding housing are defined by local and global causes as well as by local and global effects, especially related to energy production and consumption, the present research agenda considers EU-27 and Europe in general as its own geographical scope.

The research agenda delineates four main ‘thematic’ strands that define the major areas where sustainable housing research should converge: (i) social issues and behavioural aspects; (ii) planning and the policy’s viewpoint; (iii) assessment and decision tools; and (iv) energy and technology.

## **2 Objectives and scope of the research agenda on sustainable housing**

### **2.1 Strategic objectives of the research agenda**

There seems to be no commonly agreed definition of sustainable housing in Europe, even if there are *ad hoc* definitions for specific conferences and studies. The existing approaches to definitions mostly focus on building construction, energy use, and social and economic aspects.

This research agenda aims to develop and suggest a path of present and future research needs in order to help achieve sustainable housing in Europe. Our objective is, therefore, to show the most pressing and urgent issues in the sustainable housing domain, and to draw the attention of EU-based research for supporting evidence-based policy making on those issues identified by a broad group of stakeholders (policy-makers, researchers and CSO representatives).

### **2.2 Process and development of the research agenda**

The research agenda has been developed during the course of the second year of the project CORPUS. It was the explicit objective of the project to develop the research agenda in a shared effort with the participants of the CORPUS workshops and the CORPUS web-platform's users.

In order to achieve the completion of this joint research agenda, a series of steps have been followed during this experience. At first, a sequence of interviews has been undertaken with researchers from all over Europe that work in the sustainable housing domain. This step has allowed us to collect urgent issues that have received special attention when considering the sustainability of housing. We have tried to focus on the viewpoint of housing users with local, regional and European boundaries.

During the second stage of the process, which took place in one of the CORPUS workshops, we prepared a group exercise for mixed groups of policy-makers, researchers and CSO representatives from different EU member states and from different backgrounds. Thanks to this effort, we collected a large number of topics and research questions on sustainable housing. All of these inputs were compiled and then organized by the project team into four thematic areas that best suited the knowledge needs communicated to us both by the different stakeholders. In addition, the first draft research agenda document was distributed to the CORPUS web-platform users for comments.

After the users' comments, another draft research agenda was developed and new insights were collected at the last event of CORPUS' housing workshop series. Furthermore, policy-makers and researchers had the chance of adopting, commenting, rephrasing and adding to this research agenda after the workshop. After a second round of remarks from web-platform users, the joint research agenda has been finalized.

### 3 Themes of research in sustainable housing

Four themes have been identified to define those fields where research should be focussed in order to meet major challenges of sustainable housing:

1. Social issues and behavioural aspects
2. Planning and the policy's viewpoint
3. Assessment and decision tools for sustainable housing
4. Energy and technology

Each of these **themes** has received special attention and extensive reflections during the different rounds that constituted our work. For each theme, a number of **'hot topics'** for research has been identified. In addition, as third level, **'knowledge needs'** have been selected as major and urgent issues for future research.

### 3.1 Social issues and behavioural aspects

#### Theme 1

## SOCIAL ISSUES AND BEHAVIOURAL ASPECTS

#### Hot topics

#### Knowledge needs/Research questions

<b>The whole “value chain” issues</b>	<ul style="list-style-type: none"> <li>• How to make the whole ‘value chain’ more sustainable (i.e. sub-contractors, construction sites, materials)?</li> <li>• How is corruption affecting the sustainability of housing?</li> </ul>
<b>Social innovation</b>	<ul style="list-style-type: none"> <li>• How to integrate traditions/cultural heritage with new technologies?</li> <li>• Collection and evaluation of emerging trends from marginal movements, trends, experiences (e.g. eco-villages)</li> <li>• Community renewable energy and its effects on social innovation</li> <li>• What is the role of co-housing in increasing the sustainability of the housing sector?</li> </ul>
<b>Living spaces</b>	<ul style="list-style-type: none"> <li>• Is “size” an issue for sustainable housing (e.g. maximum m<sup>2</sup> per person)?</li> <li>• How to ‘nudge’ a sustainable size/living space?</li> <li>• What would be the criteria for a “sustainable size” of homes?</li> <li>• How to raise awareness on living spaces?</li> <li>• ‘Quality’ of housing (living spaces) and its relation with size</li> <li>• Impacts of demographic changes on living spaces</li> <li>• Is the dimension of housing (in m<sup>2</sup> or m<sup>3</sup>) still increasing? Is there a peak or a tendency?</li> <li>• What is the role of second houses in sustainable housing?</li> </ul>
<b>Participatory approach to behaviour change</b>	<ul style="list-style-type: none"> <li>• Finding new ways to involve end-users, on a regular basis, in sustainable housing solutions</li> <li>• What arguments (beyond sustainability) are important for energy efficiency in houses to increase the acceptance of citizens?</li> <li>• What is the impact of (increasing) energy prices on citizens’ behaviour, mainly concerning energy efficiency investments?</li> <li>• Definition of support tools to help the first-buyer to include long-term concerns (e.g. environmental sustainability, energy costs per year) instead of being driven by short-term financial issues</li> </ul>
<b>Understanding housing behaviours</b>	<ul style="list-style-type: none"> <li>• What are the drivers that have impacts on the users’ behaviours? (e.g., environmental, financial, cultural, social, etc.)</li> <li>• Overview of social patterns on how people live and use their homes in their daily lives?</li> </ul>
<b>Behaviour and lifestyles</b>	<ul style="list-style-type: none"> <li>• The role of nudging as a supportive behavioural environment?</li> </ul>

### 3.2 Planning and the policy's viewpoint

#### Theme 2

## PLANNING AND THE POLICY'S VIEWPOINT

#### Hot topics

#### Knowledge needs/Research questions

<b>Renovations</b>	<ul style="list-style-type: none"> <li>• What planning incentives could increase energy use in renovated buildings (e.g. individual metering, cost-based rents, district heating, etc.)?</li> <li>• Effects of management and diffusion of renovation practices on a large scale</li> <li>• Development of new business models for renovation</li> <li>• Analysis of impacts of renovation and retrofitting of existing building stock</li> <li>• What roles do owners and tenants have when renovating the existing building stock?</li> <li>• Research on possible funding mechanisms for renovation of existing buildings</li> </ul>
<b>Urban Sprawl</b>	<ul style="list-style-type: none"> <li>• How to avoid detached suburbs and provide incentives for short-distance travels?</li> <li>• Which types of mobility measures are appropriate to reduce urban sprawl?</li> <li>• Links between urban sprawl and rural areas – effects on planning and mobility patterns</li> </ul>
<b>Country-based solutions</b>	<ul style="list-style-type: none"> <li>• Climate-zone specific solutions: technical and social</li> <li>• Research on local materials and local traditional practices</li> </ul>
<b>Adaptability of buildings</b>	<ul style="list-style-type: none"> <li>• Demographic changes and adaptability of buildings</li> <li>• How to adapt buildings to denser cities?</li> </ul>
<b>Rural areas</b>	<ul style="list-style-type: none"> <li>• Sustainable rural development plans</li> <li>• How to adapt social services to rural areas and how to finance them?</li> </ul>
<b>Policy effectiveness</b>	<ul style="list-style-type: none"> <li>• User-centred policy design: background, best-practices, outlook</li> <li>• Strategy development: Which challenge to address? Which tools to use? How to measure effective policies?</li> <li>• How can the legal framework be adapted to the planning documents?</li> </ul>
<b>Prioritization of environmental problems</b>	<ul style="list-style-type: none"> <li>• Internalisation of environmental costs: Experiences, good practices, challenges, future development</li> </ul>
<b>Climate change and buildings</b>	<ul style="list-style-type: none"> <li>• What is the main climate change challenge for the construction of residential buildings (e.g. direct and indirect energy use)?</li> <li>• Adaptation of buildings to be more “climate sensitive” in the future</li> </ul>
<b>Design out waste from buildings</b>	<ul style="list-style-type: none"> <li>• Overview on and analysis of industrial networks within the construction sector and beyond (i.e. industrial symbiosis), e.g. life-cycle assessment for building materials, across sectors and firms</li> </ul>
<b>Spatial development</b>	<ul style="list-style-type: none"> <li>• Integrated rural and urban planning</li> <li>• Development of integrated housing and mobility systems</li> </ul>

### 3.3 Assessment and decision tools for sustainable housing

Theme 3  
**ASSESSMENT AND DECISION TOOLS  
 FOR SUSTAINABLE HOUSING**

**Hot topics**

**Knowledge needs/Research questions**

<b>Existing building stock</b>	<ul style="list-style-type: none"> <li>• Developing comprehensive and complete data sets with high-quality data on existing building stock (i.e. private/public ownership, incl. social and economic issues)</li> <li>• Environmental data-set development</li> <li>• Overview of examples and application of estimates on existing building stock</li> </ul>
<b>Life-cycle analysis</b>	<ul style="list-style-type: none"> <li>• What is the lifetime optimum considering/balancing 'energy' vs. 'resource efficiency', taking into account changes in technologies applied?</li> <li>• Development of clear and concise assessment criteria</li> <li>• How to guarantee transparency with an international measurement system?</li> <li>• What is the specific role of recycling and end-of-life issues (incl. objectives and indicators)?</li> </ul>
<b>Labelling</b>	<ul style="list-style-type: none"> <li>• How to use 'labelling' for urban planning as a simple assessment tool for decision-makers and to create tailor-made information for specific buildings?</li> <li>• What specific effects should labels have in order to move toward more sustainable housing?</li> <li>• Are labels sufficient to describe 'performance'?</li> <li>• Are labels sufficient and/or efficient for behaviour change?</li> <li>• Which kind of labels work and what exactly should be included on labels to move towards sustainable housing?</li> <li>• Comparative study: attitudes, cultures, laws on labelling in different countries</li> <li>• Developing ecological profiles for buildings (labels for information)</li> </ul>
<b>State of the art of the policies</b>	<ul style="list-style-type: none"> <li>• Analysis of existing policies: development, implementation, impact assessment, etc.</li> <li>• Study on comparability of methodologies used for standards, labels and measurements</li> <li>• Investigating the acceptance of measures</li> <li>• Analysis of the tensions faced by national ministries in terms of time-frames and strategic policy approach (i.e. short-term requirements, long-term frameworks)</li> <li>• Comparative studies on sustainable housing at the different political levels (municipalities, regions, national level)</li> </ul>
<b>Rebound effect</b>	<ul style="list-style-type: none"> <li>• Analysis of the rebound effect, particularly regarding energy efficiency in new and existing buildings</li> </ul>

### 3.4 Energy and technology

Theme 4:

## ENERGY AND TECHNOLOGY

#### **Hot topics**

#### **Knowledge needs/Research questions**

<b>Existing building stock</b>	<ul style="list-style-type: none"> <li>• How to achieve cost effectiveness in the existing building stock (e.g., return on investment in energy refurbishment of older buildings)?</li> <li>• Do-it-yourself solutions and their effectiveness in existing buildings</li> <li>• Suitability of new technologies (i.e. how to apply solar cells, collectors, heat pumps etc. to old buildings)</li> </ul>
<b>Technology</b>	<ul style="list-style-type: none"> <li>• Addressing the challenges of embedded materials and/or embedded energy in building construction</li> <li>• Lock-in situation created by existing technologies – challenges and how to overcome them</li> <li>• More sophisticated data to analyse the effect of the rebound effect</li> <li>• IT integration into everyday life</li> </ul>
<b>Design and New Buildings</b>	<ul style="list-style-type: none"> <li>• Design-out waste strategy (primarily in construction, e.g. wiring)</li> <li>• “Cradle to Cradle” principles and how they work in practice</li> <li>• Adaptability of buildings to changing needs and functions</li> </ul>
<b>Durability</b>	<ul style="list-style-type: none"> <li>• Research on materials: longevity, embedded energy, perception</li> <li>• Reuse-recycling of special material streams (e.g. PVC windows)</li> </ul>
<b>Smart metering (connecting to smart grid)</b>	<ul style="list-style-type: none"> <li>• More knowledge and effectiveness on virtual power plants needed</li> <li>• How to increase efficiency of the grid?</li> </ul>
<b>Health and indoor air quality</b>	<ul style="list-style-type: none"> <li>• Research on health and air quality regarding building materials, ventilation, and CO<sub>2</sub> emissions from buildings</li> </ul>
<b>Architecture</b>	<ul style="list-style-type: none"> <li>• Research into user-centred approach and how it can be improved</li> </ul>
<b>Skills of builders &amp; users</b>	<ul style="list-style-type: none"> <li>• Increase of training and knowledge for builders on sustainable housing, horizontal approaches (environmental, economic and social issues)</li> <li>• Development of guidelines for users to increase sustainable housing in practice</li> </ul>