A. Market Overview - *Literature based*
- Building stock structure
- Energy, emissions and climate goals
- Policy framework
- Investment and employment

B. Market technology diffusion and dynamics - *Empirical-evidence based*
- Barriers and drivers to EE technologies
- Characterization of technology selection process
- Assessment of market maturity

C. Market development and volume potential - *Building stock model based*
- Status quo of the building stock
- Feasible development
- Market volumes per technology in different RoI segments (from high to low profitability)
CHAPTER A | AIM & SCOPE

• Aim: Overview of the country’s building market, its background conditions, and current trends.
  • A1. Economy and society
  • A2. Building stock
  • A3. Energy emissions and climate goals
  • A4. Policy framework
  • A5. Investment & employment
  • A6. Demand, supply & affordability
CHAPTER A | METHOD

• Method
  • Data collection & synthesis
    • European statistical data,
    • Countries’ own statistical offices,
    • National and international public reports,
    • Scientific publications, and market information, e.g. prices and sales volumes.
A1. COUNTRY’S ECONOMY & SOCIETY

Trends in Spain’s GDP, disposable income, and population.

Source: EUROSTAT

NOTE
GDP index depicted in the graph is in current EUR.
A2. BUILDING STOCK CHARACTERISTICS

Spain’s building stock.

A4. POLICY FRAMEWORK

Progression of U-values (W/m²K) for building components in Spain.

Source: IVE, CUES

NOTE
The U Values of the building components depicted in Figure A4.1 are at the upper end of the range suggested in the technical documents.

- 2006 Edicto Técnico de la Edificación
- 2007 Building Energy Certification
- 2013 ENERER Programme for energy rehabilitation

- Windows
- Roof
- Façade
- Other floors
- Floor

- 2013 EU E-HE
- 2006 EU E-HE: Basic requirements for energy saving
- 1979 NBG-CT 76: Thermal Conditions in Buildings (Condiciones Termicas en los Edificios)
- 1975
MANY MORE INSIGHTS
CHAPTER B | AIM & SCOPE

- AIM: Stakeholders’ views on residential building projects
  - B1. Building value chain
  - B2. Building typologies & project types
  - B3. Technology competences
  - B4. Measures implemented
  - B5. Key stakeholders in the technology selection
  - B6. Motivations & obstacles in projects
  - B7. Promising approaches to reach climate goals
  - B8. Barriers & drivers to specific technologies
CHAPTER B | METHOD

• Empirical-based evidence
• Online survey to collect data
• Multi-country scale
• All stakeholders involved in the building value chain
• Stratified sample approach to describe the various market segments
• Characterisation of the population in each country > according to the statistical classification of economic activities in the European Community (NACE)
Figure B1.1: Simplified residential building value chain.

Table B1.2: Stakeholder groups per perspective in the adoption of EET

<table>
<thead>
<tr>
<th>Stakeholder group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enablers</strong></td>
</tr>
<tr>
<td>Architects, engineers, construction companies, installers, local public authorities, bank or other financial service, facility managers, Energy supply/utility or ESCOs</td>
</tr>
<tr>
<td><strong>Suppliers</strong></td>
</tr>
<tr>
<td>Technology or material manufacturer or trader</td>
</tr>
<tr>
<td><strong>Demand-side actors</strong></td>
</tr>
<tr>
<td>Investor or Developer, Housing company or housing association, cooperative, Private house owner</td>
</tr>
</tbody>
</table>
B2. BUILDING TYPOLOGIES

Definition (i.e. building types included)

- Single-dwelling building (SDB)
  - Single family houses (SFH)
  - Semi-detached house (SDH)
  - Terraced house (TH)
  - Row houses (RH)

- Multi-dwelling building (MDB)
  - Small multi-dwelling houses (SMH)
  - Large multi-dwelling houses (LMH)

Figure B2.1: Residential Building typologies in Germany. Source: TABULA. EPISCOPE

Table B2.2: Building typology clusters used in the survey.
B2. PROJECT TYPES

Figure B2.3: Life-cycle of a building: main phases, project types and interactions.

Table B2.4: Project types clustered by trigger, based on Hecher et al.

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Project type</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>New construction</td>
</tr>
<tr>
<td>Problem</td>
<td>Repair or overhaul or partial retrofit</td>
</tr>
<tr>
<td>Opportunity</td>
<td>(Deep) retrofit</td>
</tr>
</tbody>
</table>
Familiarity level with energy efficient and low-carbon technologies in Spain. The enablers’ perspective.

Source: Chalmers University, Wuppertal Institute, TEP Energy

- Part of day-to-day business
- Worked with it several times
- Worked with it once
- No experience

B3. TECHNOLOGY COMPETENCES
B4. MEASURES IMPLEMENTED

Figure B4.1
Measures implemented in overhaul, partial retrofit, or retrofit projects in (i) SDBs and (ii) MDBs in Spain.

Source: Chalmers University, Wuppertal Institute, TEF Energy

Adding a new cooling system is the most often implemented measure in SDBs, whereas in MDBs it is the maintenance or upgrade of the outer wall.
B5. TECHNOLOGY SELECTION

Stakeholder interaction in the technology selection in overhaul projects in Spain.

Source: Chalmers University, University of Stuttgart

- C. Investment or development agent
- 1. Material or technology trader
- 2. Architect
- 3. Engineer
- 4. Consultant
- 5. Installer
- 6. Constructor
- 7. Public authority
- 8. Bank / other financial service company
- 9. Facility manager - administrative
- 10. Facility manager - technical
- 11. Energy supplier / utility or Energy service company
- 12. Business association, agency agent
- 13. Investment or developing agent
- 14. Housing company agent (for profit)
- 15. Housing company or association agent (public / non-profit)
- 16. Other
- 17. Building owner
B6. MOTIVATION & OBSTACLES IN PROJECTS

Figure B6.1
In overhaul, partial retrofit, or retrofit projects in Spain, main motivations behind projects (left) and barriers for not implementing more energy efficient and low-carbon technologies (right).

Technical aspects are the most important motivations behind overhaul or partial retrofit projects, whereas economic-related matters are among the strongest barriers to not implementing more energy efficient or low-carbon technology measures in projects.

Source: Chalmers University, Wuppertal Institute, TEP Energy
B7. PROMISING APPROACHES TO ACHIEVING CLIMATE PROTECTION GOALS
B8. DRIVERS & BARRIERS TO TECHNOLOGIES

Figure B8.1
Barriers to building envelope components in Spain for:
- a. Insulation
- b. High-performance windows
- c. Low-carbon materials

Source: Chalmers University, Wuppertal Institute, TEP Energy

Economic aspects are the main barriers to large-scale implementation of building envelope components.
... & MUCH MORE

https://cuesanalytics.eu/
Thank you for your attention!

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