European Council of Engineers Chambers

ECCE EUROPEAN COUNCIL OF CIVIL ENGINEERS 40 YEARS

ECEC AND ECCE POLICY PAPER

A European Engineering Vision for Affordable, Safe and Sustainable Housing

DECEMBER 2025

1. Introduction
A European Challenge for the 21st Century

The right to housing is a well-established component of international human rights law.

The Universal Declaration of Human Rights (Art. 25) was the first internationally binding statement to recognize housing as an element of human dignity. This principle was later codified in the International Covenant on Economic, Social and Cultural Rights (ICESCR, Art. 11), which obliges states to ensure access to "adequate housing".

Access to affordable, safe, adequate and sustainable housing has become one of the most urgent challenges for European societies. Rising rents, limited housing supply, urban inequality, unsafe buildings[1] and energy poverty threaten social cohesion and Europe's competitiveness and social stability.

The European Council of Engineers Chambers (ECEC) and the European Council of Civil Engineers (ECCE) recognize housing not only as a private asset but as a fundamental public good — a pillar of welfare, resilience, sustainability, safety and economic productivity. Housing policies must, therefore, be developed as part of Europe's critical social and industrial infrastructure, on par with energy, mobility and digital networks and need to be based on an in-depth evaluation of the price-driving factors of housing covering all the various areas that require action and improvement.

ECEC and ECCE call for a coordinated approach to the housing deficit, based on an innovative-driven European strategy — one that empowers engineers, architects and urban planners to deliver sustainable, industrialized and affordable housing solutions at scale.

Both organisations strongly support this ambition and emphasise that housing must also be understood as a critical issue for a resilient society. They further propose the introduction of a European Housing Resilience Framework, integrating climate adaptation, structural robustness and long-term serviceability into housing policy.

1 An unsafe building, due to structural defects, deterioration, fire hazard, or non-compliance with modern EU or national codes and their safety requirements, may pose a danger for its occupants and the public.

2. The European Policy Context

The European Union has elevated housing to a core policy priority, integrating it into social, environmental and economic frameworks. Key initiatives include:

- European Strategy for Housing Construction
- European Affordable Housing Plan (2025 – 2027)
- Pan-European Investment Platform for Housing
- Renovation Wave and Green Deal
- New European Bauhaus
- ECCE Position Paper 3S Approach (Safe, Sound, Sustainable)
- Pilot project "Integrated techniques for the seismic strengthening and energy efficiency of existing buildings" by the Joint Research Centre of the European Commission

Through these multifaceted efforts, the European Commission demonstrates a strong commitment to tackling the housing crisis. By combining financial tools, regulatory reforms, expert input and local engagement, the EU is laying the groundwork for more inclusive and sustainable housing across Europe.

Despite this progress, fragmentation persists. A stronger European coordination of technical standards, financing instruments, education and professional competences is essential.

The need for an integration of all resilience requirements at EU-level calls particular attention – especially including concerns about seismic safety, energy efficiency, climate adaptation, flood mitigation and structural durability – so that future EU housing programmes do not address sustainability and affordability alone, but also all factors affecting long-term risk.

3. Pathways Toward Affordable Housing
Public and Private Synergies

Addressing the European housing deficit requires integration of public, private and cooperative strategies.

Public-Sector Priorities:

- Expand social housing.
- Simplify planning and permitting, e.g. by limiting excessive standardisation and requirements.
- Adoption of regulations that monitor the lifespan of the housing stock and the strategies for its maintenance, with the aim of long-term quality and resilient use.
- Mobilise vacant housing stock and use Sustainable Structural Design (S.S.D).
- Implement Urban Land Readjustment.

Private-Sector Contributions:

- Innovate through industrialised and modular construction.
- Develop cooperative housing models.
- Create new financing schemes.

Public–Private Partnerships (PPPs):

Many experiences demonstrate that PPPs may profit from private efficiency with public accountability. ECEC and ECCE call for an EU framework for housing PPPs supporting affordable and resilient dwellings.

Both organisations propose that all publicly financed and PPP-supported housing developments should be required to undergo a Resilience and Adaptability Audit, ensuring that early-phase decisions are adequately considering climate, demographic and safety demands and requirements.

They further encourage an "Adaptive Re-Use First" principle across public and private sectors, requiring systematic evaluation of existing buildings before new construction is approved — prioritising carbon emission savings, heritage protection and efficient rational land use.

All PPP-supported housing programmes should also demonstrate compliance with human-centred quality criteria to ensure that affordability does not compromise living standards.

4. Industrialised Construction
Building Faster, Safer, Better and Greener

Industrialised (off-site) construction is a key matter to meeting Europe's housing needs. Benefits include faster delivery, lower costs, higher quality and reduced environmental impact. ECEC and ECCE advocate for a European Industrialised Housing Alliance to promote standards, R&D cooperation, education and certification schemes. Industrialisation must therefore balance production efficiency with high standards of user comfort and habitability.

It is also important to ensure industrialized solutions for the renovation of the housing stock by developing different typologies and requirements for the building envelope and structural elements.

ECEC and ECCE additionally propose the establishment of:

- A European Curriculum for Industrialised Construction, covering digital twins, modular tolerances, connection typologies and easy assembly.
- A network of Demonstrator Housing Projects across Europe to validate different modules, e.g., social housing, emergency housing, student housing and adaptive reuse modules.
- Common European guidelines for the structural integrity, fire safety, seismic safety and durability of modular systems, enabling cross-border applications.
- Standard Industrialised solutions to produce affordable, safe and up to standard structures with enhanced Quality Control (SSD & QA/QC).

5. The Role of Engineers
Integrators of Innovation, Safety and Quality

Engineers are central to transforming Europe's housing sector. Their skills connect design and production for the optimum solutions, integrating balanced requirements for safety, energy consumption and sustainability. Their involvement is essential in optimising modular systems, managing supply chains, integrating smart systems, ensuring quality and safety and using digital tools, like BIM, and life-cycle analysis. Empowering engineers to assume leadership roles in industrialised, safe and energy-efficient housing is vital.

From a sustainability perspective, emphasis must be placed on developing an integrated and holistic structural and energy design methodology for both construction of new buildings and refurbishment of existing ones. The holistic approach should be preferred over individual actions to ensure Sustainable Structural Design (SSD). This comprehensive approach will greatly contribute to achieving both structural safety and energy efficiency requirement targets for new and refurbished buildings.

It is emphasised that the role of engineers is not limited to design, construct and create technical innovation, but also to act as guardians of public safety. It is therefore proposed that national governments and EU bodies formally include engineers, architects, urban planners and all other involved professions in strategic housing councils and urban development committees.

This proposal also asks for strengthening the cross-professional collaboration between Engineers–Architects–Planners-Policy Makers for a better housing policy and project delivery, reflecting the complex realities of housing as a multi-dimensional and multi-functional societal system.

6. Human-Centred Housing
A Core Quality Principle

A human-centred approach must be recognised as a central dimension of housing quality. As Europe accelerates industrialised and modular construction, it is essential that technological efficiency does not come at the expense of spatial, social, and psychological well-being. Housing must continue to support comfort, dignity, inclusiveness and a sense of belonging.

Therefore, the design and delivery of industrialised solutions must incorporate user-oriented principles – daylight, ventilation, accessibility, thermal and acoustic comfort and adaptability over a building's life cycle. These factors are not aesthetic luxuries; they are essential components of safe, resilient and sustainable living environments.

7. Housing Finance
The Engine of Affordability

ECEC and ECCE emphasise that affordability depends on both acquisition and maintenance costs. Private markets alone cannot deliver sufficient low-interest finance, especially for young adults and families. Both organisations propose:

- A European Housing Finance Facility (EIB-based)
- Increased Public Investment
- Circular Economy Principles - National Housing Banks
- Cost-rental and public credit models
- Common harmonised regulations
- Green finance instruments

Both organisations add that financing mechanisms should explicitly reward projects that:

- Demonstrate resilience over a 50 to 100 – year design life.
- Prioritise adaptive reuse rather than new construction.
- Apply digital traceability (digital passports) to ensure transparency in life-cycle carbon and maintenance budgets.
- Use Sustainable Structural Design (SSD) to minimise carbon footprint and increase resilience.

Both organisations also propose an EU-level incentive for maintenance investment, recognising that well-maintained buildings reduce long-term costs and enhance both housing safety and healthy living conditions.

8. Regulatory Modernisation and Professional Harmonisation

Fragmented national regulations and excessive standardisation with single-level requirements hinder innovation and increase costs.

ECEC and ECCE call for:

- Revising and harmonising regulations, including multi-level performance requirements.
- Mutual recognition of competences across EU.
- Reforms that empower engineers to lead technical projects.
- The inclusion of industrialisation, robustness and sustainability topics in professional education.

Both organisations propose additional measures, including:

- **A European Housing Resilience Rating**, applicable to both new and existing housing stock, covering all basic human needs like accessibility, structural safety, energy efficiency, fire safety, thermal and acoustical comfort, flood resilience and long-term durability.
- **A pan-European Housing Digital Passport system**, recording embodied carbon, maintenance data, structural performance class and repairability.
- **The integration of AI governance into housing regulatory processes**, ensuring the safe, transparent and ethical use of AI-based decision tools.
- **Clear cross-border guidance on using Eurocodes for modular, hybrid and adaptive reuse systems**, reducing regulatory ambiguity and accelerating innovation.

9. Conclusion
Empowering Those Who Can Deliver

Europe's housing crisis requires systemic innovation and cross-professional collaboration. Engineers, architects, urban planners and policy makers must work together to deliver safe, sustainable and affordable housing. Industrialised construction, fair financing, digital tools, education and regulated modernisation will shape the future of Europe's housing.

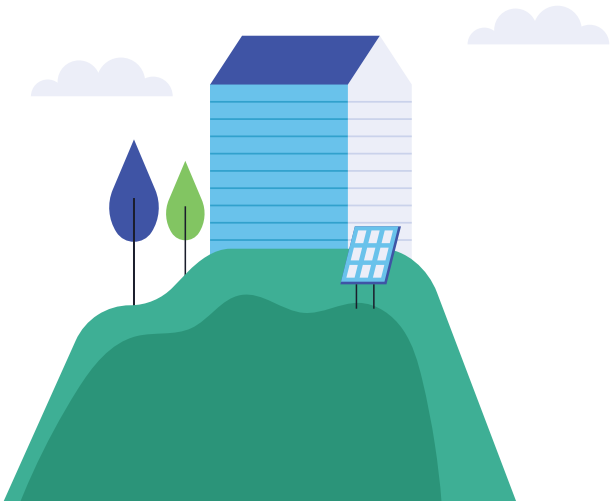
Stronger and more efficient cooperation across borders is essential to promote sustainable, resilient, rapid and industrialised housing solutions. Affordable housing for all Europeans demands mobilising talented professionals. Engineers and architects are ready to lead this transformation.

The European housing planning of the future must promote safety, resilience, climate-preparedness and adaptation to evolving needs. These proposals – ranging from resilience frameworks to digitalisation, adaptive reuse, industrialised construction training and integrated governance – provide a solid foundation for ensuring that housing across Europe is not only affordable and sustainable but also robust, future-proof, users-based and socially equitable.

The right to housing should enjoy robust recognition through multiple binding and non-binding instruments. It requires states to ensure:

- adequate, safe, users-based and affordable housing,
- protection from arbitrary evictions,
- special support for vulnerable groups and
- its recognition as a public-sector priority.

The legal framework establishes housing as an integral element of human dignity, social protection and protection of human rights. Our central message is clear:



> “Europe must deliver housing that is affordable for its citizens and engineered to be **Safe, Resilient and Sustainable.**”

Nina Drazin Lovrec
ECEC President

The European Council of Engineers Chambers (ECEC) is the umbrella organisation of European Engineers Chambers. It represents the professional interest of Chartered Engineers on European level. Its members are national Chambers or other legally established public bodies representing authorized Chartered Engineers. Currently the ECEC represents 17 Chambers and over 300.000 highly qualified European Chartered Engineers who are members in these Chambers.

https://www.ecec.net

Platonas Stylianou
ECCE President

The European Council of Civil Engineers (ECCE) established in 1985, is the voice of civil engineers in Europe, representing professional bodies from 25 member countries. It was founded on the belief that civil engineers working together can significantly contribute to advancing the built environment and protecting the natural one. ECCE promotes the highest technical and ethical standards, advises European and national institutions, and works to harmonize regulations and standards across Europe. Active in areas such as sustainability, education, ethics, and safety, ECCE supports civil engineers in building a better, safer and more resilient future for all.

http://www.ecceengineers.eu/

ANNEX A

General Definition of an “Unsafe Building”

In Europe, an **unsafe building** is generally defined as any structure whose condition presents a **risk to the safety, health, or welfare** of its occupants, users, or the public. A building is considered unsafe when it **fails to meet the minimum structural, fire safety, or health protection requirements** established by applicable national legislation, EU regulations, and European standards (such as the Eurocodes).

Key Elements of the Definition:

1. Structural Safety Deficiencies

A building is unsafe if:

- It does not provide adequate **structural resistance, stability, or robustness**, as required by the **Eurocodes (EN 1990–1999) and other national codes or directives**.
- Structural elements show damage, deterioration, or deformation that could lead to **partial or total collapse**.

2. Fire Safety Risks

Under the **EU Construction Products Regulation (CPR)** and national fire safety laws, a building is unsafe if:

- It lacks safe evacuation routes
- Fire protection systems are missing or non-functional
- Materials or installations increase the likelihood of ignition or fire spread

3. Health and Hygienic Risk

A building may be declared unsafe if:

- Indoor conditions threaten users’ health (e.g., mould, contaminated water, poor ventilation)
- Sanitary or plumbing systems are defective
- There is risk from hazardous materials (e.g., asbestos not properly managed)

4. Danger to Public Safety

A building is unsafe if it poses a hazard to the public, such as:

- Falling façades, balconies, cladding, or debris
- Instability due to ground movement or foundation failure
- Inappropriate or unsafe MEP installations

5. Non-Compliance with Legal Requirements

Across Europe, buildings are unsafe if they:

- Do not meet national building regulations
- Violate EU-mandated essential requirements for construction works, including:
  - Mechanical resistance and stability
  - Safety in case of fire
  - Hygiene, health, and environment
  - Safety and accessibility in use

ANNEX B

Summary Table – International Sources of the Right to Housing

Instrument	Article	Recognition of Housing	Type of Protection
Universal Declaration of Human Rights (1948)	Art. 25(1)	Explicit reference to housing as part of adequate standard of living	Direct / Foundational
International Covenant on Economic, Social and Cultural Rights – ICESCR (1966)	Art. 11(1)	Right to "adequate housing"	Direct / legally binding for State Parties
CESCR General Comment No. 4	–	Defines "adequate housing" (security of tenure, affordability, habitability, accessibility, etc.)	Interpretative / authoritative
CESCR General Comment No. 7	–	Prohibits forced evictions without due process	Interpretative / authoritative
European Convention on Human Rights (ECHR)	Art. 8 (indirect)	Protection of the home via "private and family life"	Indirect via case law
Revised European Social Charter (1996)	Art. 31	Explicit right to housing; prevention of homelessness; affordability	Direct, European regional
EU Charter of Fundamental Rights (2000)	Art. 34(3)	Social housing assistance and housing support	Social rights / EU framework
Convention on the Rights of the Child (1989)	Art. 27	Adequate living conditions including housing	Direct, child-focused
Convention on the Rights of Persons with Disabilities (CRPD)	Art. 28	Adequate standard of living and housing for persons with disabilities	Direct
CEDAW	Various	Housing in the context of non-discrimination and women's rights	Indirect / thematic

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