



Area 3 - Responsible Architecture

ACE Vision for the Regeneration of the EU Building Stock

ACE Policy Position

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BACKGROUND

- This policy position is the ACE contribution to the [Leaders' Summit](#) – an event organised in the framework of the [BUILD UPON project](#), which took place on 20-21 September 2016 in Madrid. The ACE was an official partner of this event.
- The objective of the Summit was threefold: 1) to build a *community* of public, private and non-profit stakeholders across Europe who can take on the long-term challenge of designing and implementing national renovation strategies; 2) to build a *common vision* of what we want to achieve by 2050 in terms of renovation; 3) to build the foundations of a *strategy for coordinated action*, to achieve this vision and define indicators to track the progress made.

HIGHLIGHTS

ACE calls on the EU institutions and Member States to consider the following interventions:

1. Target Total Building Performance beyond a building's energy efficiency potential;
2. Mandate the validation of achieved performance in use;
3. Join up the architectural upgrade of buildings with performance-related retrofit;
4. Incentivise designing for long-term adaptability and resilience to climate change;
5. Ensure that the social & economic regenerative effects of retrofits are magnified from building to neighbourhood and city scale;
6. Facilitate open data & empower continuous improvement via research & development;
7. Invest in education and life-long learning to improve skills of professionals.

ACE POLICY POSITION

ACE has been actively calling on EU institutions and national governments to take concrete and innovative steps towards a low-carbon built environment that is resilient to the impacts of climate change. Currently, around 40% of total greenhouse gas emissions are attributable to the use of energy for maintaining comfortable and productive environments in buildings. The sector is the single largest contributor to climate change even before counting the impact of any new construction. With the majority of the 2050 EU building stock already in place, the reduction of greenhouse gas emissions can only come from a radical transformation of existing buildings and neighbourhoods.

Energy efficiency retrofits concentrating solely on technical and fabric improvements have been shown to fall short of the expected reductions in emissions while failing to generate significant uptake. They often compromise the long-term resilience and cultural value of existing buildings, including those of historic value.

To realise a step-change in reducing the energy consumption of buildings a new approach is required, one that promotes 'deep renovation' of buildings, where energy and resource



efficiency complements the functional, spatial and material reconfiguration of buildings. Retrofits need not just to improve the energy performance of buildings but to empower occupants and adapt to their changing needs. In other words ARCHITECTURE has to be at the heart of retrofit policies of the EU and its Member States.

The architectural approach entails the balancing of a broad range of factors, be they economic, social, environmental, political and cultural. Architects create bespoke designs integrating structural, technical, spatial and material solutions for each project that balance the passive and active measures required to control indoor environments to meet the long term needs of occupants. Architects are unique in their focus on occupant's experience and well-being. In the construction industry, architects are the chief proponents of stakeholder needs and occupant satisfaction yet current energy and environmental legislation can do far more to enable the transformational power of architecture.

ACE calls on the EU institutions and Member States to consider the following interventions:

1. Target Total Building Performance beyond a building's energy efficiency potential

Achieving energy-efficient buildings is not the *end objective* of renovation strategies, but rather a *means* to deliver benefits across many different spheres¹ (health, well-being, energy-poverty, productivity, employment, etc.). The concept of *efficiency* must be broadened to include all three pillars of building performance. We consume energy and natural resources to achieve healthy and comfortable indoor environments that occupants perceive to be such. ACE advocates that significant improvements in building energy performance can only be achieved if financial and regulatory incentives are targeting all three pillars of building performance: low energy consumption, high indoor environmental quality and occupant satisfaction. When accounting for resources consumed, the life cycle assessment of products and materials should be included.

2. Mandate the validation of achieved performance in use

Current legislation does not mandate the reporting of achieved operational performance or the validation of the indoor spatial and environmental quality achieved. This has caused major unintended consequences, including a significant gap between the expected and achieved energy performance of buildings that must be tackled by revised EU legislation.

ACE underlines the importance of focusing on occupant needs and influencing behaviour to achieve a step change in providing comfort and well-being at low energy use. Without a step change in the understanding of user interface and maintenance requirements, performance improvements will continue to fall far short of forecasts.

A greater emphasis is needed on the evaluation of buildings over their lifecycle so that architectural factors contributing to energy efficiency, such as building form and mass, usability, spatial adaptability and other parameters are recognised as preferential over solutions that may appear more effective and lower cost in the short term such as mechanised/automated heating, cooling, ventilation, lighting solutions.

The design of 'smart buildings' cannot be seen as the universal solution to decrease the carbon footprint of the built environment. Generally more fragile, they require high technicity for their operation and routine maintenance. ACE advocates that until the benefits of smart technologies are evidenced by statistically significant performance data in use, priority should be given to simple, passive, low-tech, locally tested solutions that do not consume energy and are less prone to human error.

¹ [Capturing the Multiple Benefits of Energy Efficiency, International Energy Agency \(IEA\), 2005](#)



3. Join up the architectural upgrade of buildings with performative retrofit

Evidence shows that the architecture of buildings has a major impact on overall building performance: a building's situation as well as spatial and material configuration have a significant impact on the energy required to meet occupant needs. Occupants also report greater flexibility in thermal comfort when they are satisfied with the design and functionality of their environment. Physical parameters, such as ceiling heights, opening sizes, light reflectance, thermal mass, and layout influence productivity, health and well-being in buildings and how energy is used to achieve this.

While upgrades of the building fabric and systems are essential to achieve improvements in energy performance, their benefits are massively augmented when implemented as part of a deep retrofit, including an architectural and functional upgrade. The financial return on such investment can cover the cost of the investment through increased property value while the payback time on retrofits purely aimed at fabric and systems performance is usually counted in decades.

In recent years, the financing of energy efficiency measures, in particular the retrofit of the existing building stock, has been de-coupled from investment in the spatial and architectural design of buildings. With legislation prioritising technical solutions to energy efficiency, the business case to undertake spatial and architectural renovation as the main part of any retrofit operation, has been undermined. As Member States embark on one of the largest retrofit efforts ever undertaken, there is a major opportunity to improve the uptake of efficiency measures by interlinking financial instruments with the must of architectural design and renovation. By re-connecting energy efficiency with market drivers for architectural renovation, public investment in energy efficiency will offer far greater returns and achieve greater traction and robustness for technical solutions.

Financial instruments can build on successful schemes already available, which need to be further developed: tax exemptions and rebates, Energy Performance Contracting, or on-bill financing. Reduced VAT rates for construction services and energy efficiency goods shall be promoted. Having financial tools (e.g. lower interest rates) specifically tied to the (renovation into) nZEB level would also be a relevant improvement. The "*split incentive*" between landlord and tenant should be addressed more thoroughly. Learning from past failures, such as the UK Green Deal, financing tools should be easily accessible, cheap, and available on the long term.

4. Incentivise designing for long-term adaptability & resilience to climate change

Current legislation does not require designs to be tested against different use or occupancy scenarios nor against future climate models. The rising risks of overheating and flooding must be tackled by EU building legislation.

To live well is to occupy buildings that are fit for purpose and capable to adapt to future needs. ACE promotes innovative solutions that favour shared spaces and facilities that can adapt to multiple uses.

5. Ensure that the social & economical regenerative effects of retrofits are magnified from building to neighbourhood and city scale

Regenerated cities should combine density and intensity in a balanced way and harmoniously integrate housing, offices, shops and community facilities. Access and mobility shall be defining elements: to live well is to live near jobs, services and public transport. Compact city and functional diversity should be prioritised in urban and neighbourhood plans alongside health and



well-being.

Renovation strategies should support sustainable cities, encourage communal living conditions and facilitate social inclusion for present and future generations. The sustainable city is not one of closed groups and confinement but a lively city where public spaces belong to the citizens. ACE promotes a better understanding of the factors behind the success of historic buildings and neighbourhoods and their contribution to cultural identity.

ACE calls on decision-makers and building professionals to take into consideration local priorities, needs and culture; take advantage of local resources and locally proven technical solutions; and involve local communities. ACE advocates the use of local resources adapted to context and delivered through short supply chains, in order to reduce the building's carbon footprint and promote the "ownership" of the project by residents.

Renovation strategies should be collaborative involving all urban developers: councillors, residents, architects and the entire built environment team. Their action should be based on governance mechanisms shared by all.

6. Facilitate open data & empower continuous improvement via research & development

ACE calls for the creation of a transparent and harmonised reporting and benchmarking of building energy use and building performance indicators by Member States; the mandatory EU-wide disclosure of building operation performance across all sectors; and the implementation of measurement and verification of energy performance in use.

Supporting research in the overlap of architecture and energy/resource efficiency is a priority if the legacy of EU investment in energy efficiency is to stand the test of time. The architectural profession in Europe has much research potential but is in need of leadership to enable it to develop new evaluation tools, products and services. Increasing investment in cross-disciplinary research and development across the construction industry, including architecture, should be a priority.

7. Invest in education and life-long learning to improve skills of professionals

Regenerating the building stock requires professionals well educated and trained. ACE underlines the importance of investing in education, both at secondary and higher education levels, in order to deliver high quality-graduates, able to implement adequate urban and architecture policies, as well as the most advanced techniques and materials.

The significant and rapid evolution of construction techniques and their increased complexity; the evolution and expansion of the legal, regulatory and standardisation framework; and the increased complexity and the mutations of the professional framework (ex: BIM) require to invest in the continuing professional development of professionals as well, in order to ensure that their skills and knowledge are constantly updated to a progressive and sustainable society.

ANNEXES

- [ACE Manifesto Position on the Role of architecture in Energy Efficient Construction](#)
- [ACE-CNOA-UJA-CIAF Manifesto for Responsible Architecture](#)