



ACE Manifesto

The role of Architecture in Energy Efficient Construction

Draft Policy position

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TARGETS

Directorate-General for Energy (ENER)
Directorate-General for Environment (ENV)
Directorate-General for Climate Action (CLIMA)

BACKGROUND

- It is widely acknowledge that the built environment is the largest sector to achieve energy savings: Buildings in Europe are responsible for 40% of energy consumption¹ and it is estimated that 75% of our housing stock is energy inefficient². Buildings are the main contributor to greenhouse gas (GHG) emissions (36% of the total CO₂ emissions in Europe).
- In 2014, EU leaders agreed a binding target to reduce EU domestic greenhouse gas emissions by at least 40% below the 1990 level by 2030. They also set a target of at least 27% for renewable energy and energy savings by 2030.
- Energy in buildings is used to create safe, comfortable and productive indoor environments and a building's configuration and architectural quality plays a fundamental role in occupants' perception of these factors.
- A major weakness of current energy efficiency legislation is that it does not sufficiently promote the architectural determinants of energy efficient buildings. Nor does it mandate the reporting of achieved operational performance or the validation of the indoor spatial and environmental quality achieved.
- EU legislation supporting EU targets by 2020 and 2030 in the building sector, namely the Energy Efficiency and the Energy Performance of Buildings Directives, have been shown to result in significant unintended consequences and have suffered from low credibility and poor implementation by Member States.
- With legislation focusing on technical solutions to energy efficiency the business case to undertake spatial and architectural renovation as part of an energy efficient retrofits has been reduced. Incentivising more holistic solutions would significantly increase the uptake of energy efficiency measures.

⇒ **ACE campaigns for legislative change that recognises the role of architecture to deliver a step change in energy efficient construction to reach EU GHG, renewables and energy savings targets by 2030 while improving quality of life.**

¹ Directive 2010/31/EU of 19 May 2010 on the energy performance of buildings (recast)

² Communication on a *Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy*



ACE POSITION – SHORT REPORT

1. The importance of the Architect's skillset

The energy performance potential of a building is governed by architectural solutions developed during the design stage. The project orientation, its spatial and material configuration, the design of adaptable volumes have as much impact on the energy consumed by the building as the performance levels of construction materials. The total carbon emission of the building throughout its lifespan is closely linked to the quality of the design phase studies as well as the architect's ability to coordinate the input of engineering and construction disciplines to realise a project that meets the long-term needs of occupants. Post Occupancy Evaluations demonstrate that design quality plays a key role in occupants' perception of safety, comfort and productivity.

The design of intelligent buildings cannot be seen as the universal solution to decrease the carbon footprint of the built environment. Generally more fragile, intelligent buildings require high technicity for their operation and routine maintenance. The necessary expertise and cost of their maintenance needs to be adequately planned for to ensure that the building stands the test of time.

Architects have an important contribution to make to many of the societal and environmental challenges that impact on quality of life many of which are articulated spatially.

⇒ ACE Policy recommendations

- The contribution of architecture to energy efficient construction should be recognised and promoted by relevant legislation, standards and funding programmes,
- Consensus is needed on the skills and contribution of Architects, backed up through evidence,
- Architectural design should be recognised officially through inclusion on the OECD list of skills,
- The ACE emphasises the importance of design studies and promotes simple, passive, low-tech oriented solutions that do not consume energy and are less prone to human error,
- The ACE advocates that priority should primarily be given to locally tested passive means of heating, cooling, ventilation, humidification, lighting/glare control and acoustics.

2. Performance gap

Current legislation does not mandate the reporting of achieved operational performance or the validation of the indoor spatial and environmental quality achieved. As a consequence going beyond compliance requirements and targeting operational building performance is not incentivised. The 'compliance only' mind-set overlooks building construction and operational risks and has resulted in a **significant gap between the expected and achieved energy performance of buildings.**

A greater emphasis is needed on the operational lifecycle stage of buildings so that architectural solutions, such as building form and mass, usability, spatial adaptability and other parameters are encouraged over mechanised/automated heating, cooling, ventilation, lighting and vertical transport systems. Studies have shown that the cost of these risks can



amount to between 2-5% of the capital cost and up to 50% of the maintenance cost of a project³.

The lack of a transparent relationship between EPC ratings and actual performance outcomes can compromise the long-term resilience of a building and is causing a credibility gap in terms of the national adoption of current energy legislation.

⇒ ACE Policy recommendations

- Introduce the requirement for 'feedback' into the procurement process alongside the disclosure of key building performance indicators to address the performance gap and achieve the following:
 - Improved architectural merit to increase stock resilience to transient occupancy, changing climate and demographics
 - Reduced maintenance costs
 - The validation of innovative solutions and practice to spur on research and innovation
 - Improved profitability for all supply chain actors, from investors, developers, landlords, occupiers, design teams, contractors and FM
- Implement changes to directives (inc. EPBD, EED, Procurement, etc) to address the need for more transparent and harmonised reporting and benchmarking of building energy use; for the disclosure of building operating performance across all sectors; for the implementation of measurement and verification of energy performance in use; for EPCs to meet market needs and have a transparent relationship to actual energy use
- Implement legislation for a building's lifetime operational energy use to be evaluated and reported alongside overall building performance and occupant feedback
- Require Member States to report on building level performance indicators transparently
- Develop new incentives for unregulated 'risk factors' relating to construction quality and operating conditions can be adequately assessed at design stages
- Underline that the control of building services requires significant design innovation and quality control to improve the interaction between building occupants and systems, requiring the input of architects and designers

3. Financing of energy efficiency in buildings

The cost of reaching the targets in energy savings and energy efficiency in the building sector cannot be carried by the private economy alone. The long term maintenance and resilience risks have posed an additional challenge to the economic viability of energy efficient building retrofits. With the uncertainty associated with the capital and whole life cost of technological interventions, owners and occupiers have showed a low willingness to invest in the energy efficient upgrade of their buildings. ACE member organisations have reported increasing social tensions resulting from rising rental costs due to the higher investment required for low-energy refurbishments. Tighter legislation that does not address such concerns will continue to be viewed as a barrier for investment by building owners and operators.

In recent years the financing of energy efficiency measures, in particular the retrofit of the existing stock has been decoupled from investment in the spatial and architectural design of buildings. Due to current legislation, architectural quality is often perceived as an impediment to energy efficiency rather than the foundation of it. Energy efficiency is a cultural as well as

³ Innovate UK BPE study



technical challenge and examples of outstanding building performance manifest an architectural response to the way in which occupants can now interact with building fabric and systems. This type of innovation must continue and needs to be incentivised.

Energy efficient living needs to become a lifestyle pattern that is engrained in the spatial and material configuration of buildings. As EU member states embark on one of the largest ever retrofit efforts ever undertaken, there is a major opportunity to improve the uptake of efficiency measures by interlinking the financial instruments for energy efficiency measures with architectural design and renovation. By re-connecting energy efficiency with market drivers for architectural renovation the public investment in energy efficiency will offer far greater returns and achieve greater traction and robustness for technical solutions.

⇒ ACE Policy recommendations

- Support the development of innovative financial schemes for EE in buildings that appreciate architecture as part of the solution rather than an on-cost
- Incentivise the banking sector to recognise the value of energy efficiency interventions in conjunction with architectural renovation/design
- Invest in the research of the relationship between architectural design and the perception of safety, comfort and productivity as well as energy consumption

4. Research & Innovation

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 Architecture profession in Europe has much research potential but is in need of leadership to enable it to develop new evaluation tools, products and services. According to the US Research agency Battelle energy and the environment are key to the future of global research and development (2014). In 2013 the total European construction market was estimated as €1664 billion. There are 565000 Architects in Europe, 74% of whom are in one person practices (ACE, 2014). The number of Architects in Europe is growing while, at the same time, their share of the construction market is shrinking meaning that it is increasingly rare that they are given the opportunity to exercise their high level design and research skills, usually honed over five years of university training, on the design of our built environment. Currently only 6% of revenue is generated from work by European practices from outside their own countries (ACE, 2014) and there is much potential for growth in this area. This is hampered by a lack of collaboration and a lack of research and development investment right across the construction industry. There is a danger that without the necessary leadership European ARP will fall behind as other economies invest greater levels of GDP in research.

⇒ ACE Policy recommendations

- Develop a strategy for the development of research and collaboration across the construction industry
- Streamline cumbersome European building procurement processes (OJEU) to free up time for research and innovation
- EU research funding calls that target Architects and other built environment professionals.
 - Increased opportunities for Architecture SMEs and micropractices through the procurement of EU projects and the development of research



- In the UK, for example, Architects are given tax credit for Research and Development⁴. This facility should be made available across Europe
- A barrier to the development of Building Performance Evaluation is a concern that it will impact upon Indemnity Insurance if poor performance is identified. Insurance providers need to facilitate research and innovation through the development of their policies.
- Industry reform particularly through project procurement climate change and building performance offering improved opportunities to SME and micropractices
- Architecture needs better representation on the reviewing bodies of the European research councils
- Incentivisation of interdisciplinary work and collaboration with industry
- ACE supports R&D for EE in buildings through participating in EU funded projects developing innovative solutions for retrofitting and overcome barriers towards it

5. Energy literacy / CPD

- Implement incentives to improve the energy literacy of all stakeholders

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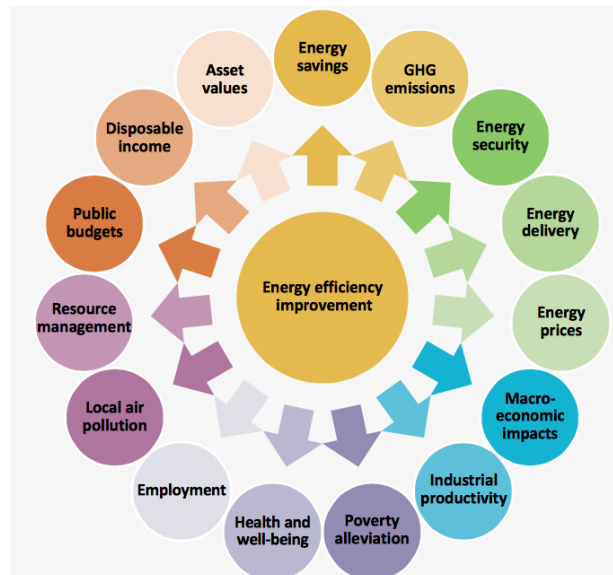
ANNEXES

⁴<https://www.architecture.com/Files/RIBAProfessionalServices/ResearchAndDevelopment/RIBATaxCreditScheme-AGuideForArchitects.pdf>



Link to other ACE position:

- [ACE response to the public consultation on Sustainable buildings](#) - October 2013
- [ACE policy position on Closing the Performance Gap](#), adopted by the ACE GA in April 2013
- [ACE policy position on Life-Cycle Assessment](#), adopted by the ACE GA in April 2013



Source: International Energy Agency, *Capturing the Multiple Benefits of Energy Efficiency*, 2014