

# FIRE SAFETY ENGINEERING COMPETENCY

An Industry Assessment and Recommendations



MODERN  
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ALLIANCE

Safe and sustainable construction with plastics

*This report brings insight to the importance of Fire Safety Engineering (FSE) competencies and highlights the need for fire safety engineers to be more involved in building design, renovation, construction, and maintenance. This need calls for a harmonized approach for fire safety engineering and a clear definition of the roles and responsibilities of fire safety engineers in EU member states.*

## THE EVOLUTION OF FIRE SAFETY ENGINEERING

There is a global call for professionalization of Fire Safety Engineering (FSE) by fire safety practitioners, [academics](#) and some EU member states' stakeholders in fire safety. From [Australia](#) to the US and the EU, there are demands for a professional recognition of fire safety engineers to aid the global shift from prescriptive legislation to a performance-based approach in order to tackle the ever-evolving fire safety challenges. This global call was evident when the International Organization for Standardization (ISO) inaugurated ISO/TC 92/SC4. In the technical committee ISO/TC 92, experts from all over the world are working on standardization to increase fire safety. Subcommittee SC4 deals specifically with the topic of fire safety engineering. In Europe, such a call was made in 2014 by the Society of Fire Protection Engineers (SFPE) Europe in its [white paper](#) termed "White Paper for Professional Recognition for Fire Safety Engineering".

Prior to the call by SFPE Europe in 2014, the Benefeu project (financed by the European Commission) was initiated to identify the potential benefit of FSE in Europe. Its conclusions and recommendations released in 2002 were analyzed more than 15 years later in CEN/TR 17524:2020, considering the enlargement of the European Union. These recommendations included:

“

1

*“To create a network of fire regulators to steer concerted action towards the transition from prescriptive codes to performance-based codes, allowing the application of fire safety engineering techniques.*

“

2

*To create a harmonized framework within which performance-based codes can function and create a model code.*

“

3

*To set up an advisory committee on research, which will list and prioritize the most urgent and important research needs in support of performance-based regulations.*

“

4

*To develop a mandate for standardization, building on existing knowledge and the results of the identified, targeted research.*

“

5

*To undertake all necessary action to define the professional education needs and the conditions for professional recognition.”*

Twenty years later, it has become clear that there are differences across the European Union member states on the way to proceed on FSE. The consequence is that the national implementation of performance-based codes in Europe is far from being widely accomplished.

The effort of the Benefeu Consortium was a strong foundation for the European Committee for Standardization Working Group 8 (CEN/TC127/WG8), dedicated to FSE and for some projects undertaken by European Commission's DG Joint Research Center (JRC). Activities carried out under those two bodies indeed validated the desire of the European Commission to draw more attention to FSE in Europe. These steps by the European Commission are commendable. The member states are able to work alongside the European Commission and expedite full implementation of the use of FSE in their countries.

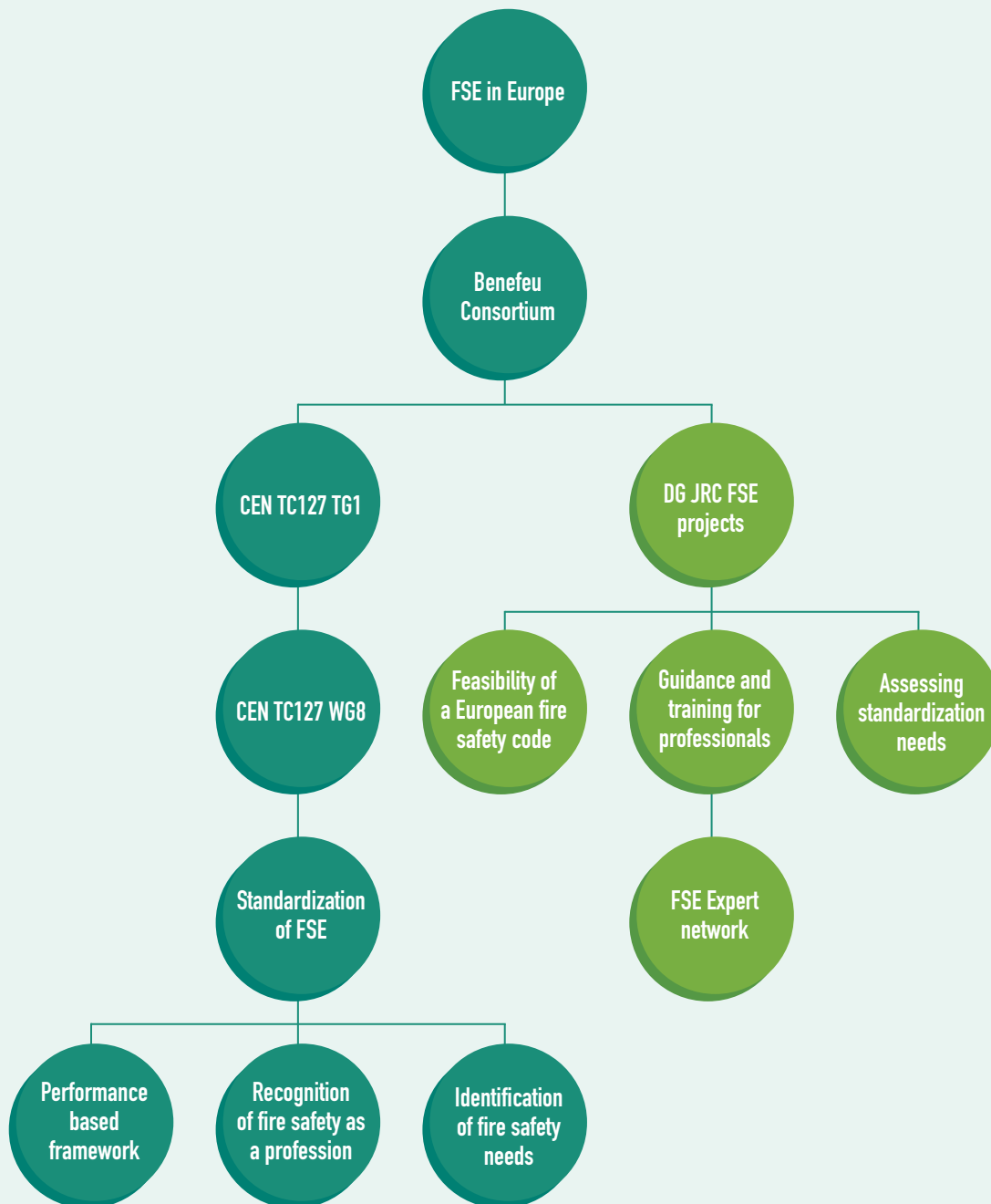


Figure 1: Evolution of FSE in EU

*“A number of programs for pre-standardization have already been identified by CEN/TC127/WG8, including a performance-based framework, recognition of the profession, identification of needs”<sup>1</sup>* etc. The burning question now is what is the status of these programs and what is next? There is a crucial need for plans and implementation.

Currently, due to the slow pace of the acceptance of performance-based design and transfer of applied FSE methods from one country to another, the circulation of fire safety services within the European Union (based on a performance-based design code) is challenging. In general, fire safety practices still rely heavily on prescriptive code applications. This is irrespective of the enormous changes and advancement in innovation and development as regards to new technologies, construction products, building design etc.

In 2017, Tim Yates interviewed several European organizations and representatives concerning the application of FSE in member states. The report<sup>2</sup> indicates that *“91 % consider that FSE is an accepted approach, with 41 % in strong agreement. While they agreed that in theory FSE is accepted, they consider that in practice, it is not applied to the extent it could be. The report further stated that 40 % of the regulators needed more information to increase the application of FSE on their country, while this percentage was even 70 % for other stakeholders”*.

This reveals that there is a gap between the available information regarding FSE and what is obtainable by regulators from member states. An attempt to close this gap will enable FSE methods to reach their full potential through adequate funding for research and that fire safety engineers are involved in projects from initial stage, up to and including renovation. Therefore, **the development of training and education to satisfy the future needs of FSE in Europe is paramount**, with a need to mobilize global awareness to support the process.

## THE ROLE OF THE FIRE SAFETY ENGINEER

FSE is based on knowledge from scientific investigation of fire and its consequences. To satisfy the constraints set out in the current global fire safety challenges, a fire safety engineer must have the educational background to understand fire dynamics, structural performance, human behavior in fire, material/product reaction to fire etc. rather than follow some checklist-based regulations. It should be stressed that fire safety engineers need to be (a group of) experts having different aspects of knowledge most especially in other fields of engineering to be able to address fire safety satisfactorily. There should be synergy between the fire safety professionals and other professions in the construction sector through education and research.

Furthermore, the role of the fire safety engineer must be undertaken by persons who possess a range of the correct competencies, comprising professional attributes, skills, and essential knowledge. This will be the first step towards defining the competency of the fire safety engineer. There will be a high demand for competent fire safety engineers soon but there are not enough well-educated and competent fire safety engineers to meet this expected demand. This is despite the increasing number of university programs in FSE in Europe.

*“If government is to act on protecting its citizens from risks, then it needs to understand what these risks are and how they can be mitigated. The role of expertise in risk governance thus hinges on two types of activity: the production of appropriate knowledge; and its communication to policy-makers. For such a mechanism to work well these two processes should be linked; **those with appropriate knowledge should be the ones that government turns to for expert advice**”<sup>3</sup>*

<sup>1</sup> CEN/TR 17524:2020: 5) Fire safety engineering in Europe — Review of national requirements and application.

<sup>2</sup> YATES, T., Study to evaluate the need to regulate within the framework of Regulation (EU) 305/2011 on the toxicity of smoke produced by construction products in fires, Final report, October 2017

<sup>3</sup> Spinardi G., & Law A, 2021 à Performing Expertise in Building Regulation: ‘Codespeak’ and Fire Safety Experts.

## THE MODERN BUILDING ALLIANCE RECOMMENDATIONS

1

The Modern Building Alliance agrees with the CEN/TC127/WG8 that **an analysis of the needs of the construction market for fire safety engineers should be carried out to understand the short-term needs of the FSE profession.** The Modern Building Alliance suggests that this proposed analysis be extended to identifying the roles and responsibilities of fire safety engineers in projects within the European Union.

2

We support that **a well-defined and harmonized accreditation framework** for the FSE profession is needed in the EU. This will allow free flow of the services offered by the fire safety professionals between the member states.

3

The Modern Building Alliance supports **that the recommendations** from the separate studies of CEN/TC127/WG8 and of the JRC FSE projects **are carried out.**

4

The Modern Building Alliance promotes that the EU fire safety **competency, education, and training** is taken up in FIEP.

5

We encourage the broader and quicker implementation of FSE in member states regulations.

### LIST OF IMPORTANT REFERENCES:

1. YATES, T., Study to evaluate the need to regulate within the framework of Regulation (EU) 305/0211 on the toxicity of smoke produced by construction products in fires, Final report, October 2017, published Jan 2018.
2. Lange D. et al., Identifying the attributes of a profession in the practice and regulation of fire safety engineering. [Fire Safety Journal 121 \(2021\) 103274](#)
3. SFPE ECG: [White Paper for Professional Recognition for Fire Safety Engineering 2014](#)
4. Athanasopoulou A et al., Fire Safety Engineering approach in the built environment: Status, challenges, and the future in the EU. Presentation at the European fire safety week 2021.
5. Fire safety engineering in Europe — Review of national requirements and application. [CEN-TC127-WG8 N0192 Templated- W100127392-Final draft 27jan2020.](#)
6. Spinardi G., & Law A. (2021), [Performing Expertise in Building Regulation: 'Codespeak' and Fire Safety Experts.](#)

## ABOUT THE MODERN BUILDING ALLIANCE

We are an alliance of trade associations and companies representing the plastics industry in the construction sector. Plastics are increasingly used in building and construction applications to make our buildings more sustainable, from window frames and durable pipes to state-of-the-art insulation solutions. An essential pillar of our cause is the ambition of greater fire safety across the construction industry. It is a key driver of our product design and manufacturing; improving fire safety in buildings is a joint responsibility of the whole value chain involved in building and construction. By engaging with policymakers and stakeholders, we are committed to supporting the EU in ensuring safe and sustainable construction for people across Europe.

### MODERN BUILDING ALLIANCE MEMBERS (IN 2023)

BASF • COVESTRO • DOW • KINGSPAN • EUMEPS •  
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