European countries still work and focus on innovation in the area of Fire Safety and Fire Rescue in relative isolation. This is partially the effect of the principle by which the European Commission does not have the mandate to regulate fire safety within the member states of the European Union. It does not mean that the Europe does not have a need to collaborate in this area. Contrary is the case. Even if it is very difficult to agree on common European fire regulatory framework all member states share similar problems and challenges when it comes to fire safety and fire rescue and innovation in this area.

But why is innovation and especially good-value-for-money innovation difficult in Fire & Rescue? Some identified reasons for that can be probably the fact that Fire Safety and Rescue is still not widely perceived as an active research area. Europe is also lacking innovation networks and linkages between research and practitioners, and experiences difficulties of cross-organizational/cross-border harmonization and identification of synergy potential and the lack of proper organizational and governance structures in this area.

It is therefore highly justified to better coordinate efforts, activities and communication within Europe between the practitioners, innovators and the industry.

In response to such needs a new pan European initiative Fire-IN has been launched, which is a European platform for exchange the experience and the latest knowledge across the Fire Safety community.
Fire-IN is the first European Fire and Rescue Innovation Network lead by the French National Fire Officers Academy ENSOSP and SAFE Cluster. This project has received founding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No. 740575. The main objective is to improve the national and European Fire and Rescue capability development process. It is done by:

1) Identification and harmonization of operational capability gaps;
2) Scouting of promising solutions;
3) Definition of a Fire and Rescue strategic research and standardization agenda;
4) Faster and cheaper access to state-of-the-art technology for the whole Europe.

The details of the project and the associated activities of the project are documented on the common e-platform which is accessible at [www.fire-in.eu](http://www.fire-in.eu).

The advantages of better integration of the fire safety and rescue community and common e-platform are for example efficient R&D investments based on practitioners expectations and reduced implementation time, saved money by tests and experiments results from one country shared at EU level so there is no need to conduct them again or simplified collaboration between practitioners in EU and worldwide.

The participating institutions are an important strength of FIRE-IN. These include mostly leading European research institutes, fire and rescue services, governmental agencies and educational entities.
The project success relies on the active participation of associated experts community. It is a dynamic and constantly growing network, which includes professionals from the whole Europe and beyond, representing practitioners, research and technology organizations, industry and standardisation bodies, policy makers and other fire and rescue stakeholders.

Fire-IN is a 5 year project (2017-22) with its work divided in three main cycles which aim at gathering information and gradual deepening of the analysis and synthesis.

Cycle 1: Identification of Capability Gaps: Fire and Rescue practitioners requirements and needs

Cycle 2: Identification of Research, Development and innovation (RDI) capability challenges.

Cycle 3. Identification of common RDI capability challenges (CCCs) between the TWGs
Collaboration between project partners includes regular meetings, workshops and various project deliverables. Workshops involve discussions among the project partners and invited experts on several main topics of the project. Five thematic working groups were established:

A) Search and Rescue (SAR) and Emergency Medical Response (EMR);
B) Structural Fires;
C) Landscape Fires;
D) Natural Hazards Mitigation;
E) Chemical, Biological, radiological and Nuclear (CBRN) defense.
The five thematic groups (TWG) of the project are presented below.

A: Search and Rescue (SAR) and Emergency Medical Response (EMR):

Specific challenges for SAR include skills and capacities of localization, stabilization, evacuation in all terrains (water, mountains, remote and non-accessible areas) and all context (transportation accidents, disasters, etc.)

In EMR for the same range of context and terrains – challenges include triage, trauma and life support, decontamination of people, large number of victim’s management (mass rescue organization, field hospitals), transport to safe areas (ground and air transport), facilities management.

The 1st TWG A Workshop took place in March 2018 in Barcelona, and the second workshop in March 2019 in Paris. The Scenarios considered an airplane crash in the mountains, search and rescue in a cave and an earthquake event in a city. For more information on the progress in TWG A please visit the project’s e-platform.

B: Structure fire crisis mitigation, prevention and protection:
The structure group will tackle the mission of extinguishment, mitigate the risk of, prevent and protect from fire involving any man-made building or structure. Challenges to be tackled include:

**Mitigation:** real time intelligent warning system: situational with regard to location of people; trustworthy fire and fire products propagation models; kit needed to counteract critical fires into confined spaces and high rises.

**Prevention:** improving emergency procedures through better understanding human behavior; scenario building for fire and fire product propagation; impact of extinguishing systems and human behavior simulations.

**Protection:** predicting fire behavior over different materials and using different extinguishing systems; energy efficiency; fire safe buildings materials; intelligent fire detection systems; integration of intelligent exit signs with real time simulation of fire propagation based on detector’s data.

The 1st TWG B Workshop took place in February 2018 in Rome and the second workshop in February 2019 in Praha. To explore the Common Capability Challenges three scenarios were considered: high rise building fires, road tunnel fires and prevention issues in a shopping center. For more information and progress in TWG B please visit the project’s e-platform.
Main areas of focus in Working Group C are fires affecting natural landscapes (natural forests, range lands, peat lands), cultural landscapes (industrial plantation forests, open land ecosystems and agricultural lands), protected areas and urban-industrial landscapes. The required expertise to reduce wildfire-hazards and wildfire disaster-risk needs to be derived from many scientific disciplines, sectoral institutional knowledge and the known or unknown needs and requirements of affected civil society and meet rather diverse challenges:

- Fire prevention (reduced human-caused ignitions);
- Wildfire-hazard reduction (fuel reduction);
- Fire-use in ecosystem management (use of prescribed fire for conservation / biodiversity management and wildfire-hazard reduction) and for wildfire suppression (suppression firing);
- Inclusion and empowerment of civil society in wildfire prevention, safe-fire use and self-defense against wildfires;
- Management of multiple simultaneous wildfire events and extreme wildfire crises.

The 1st TWG C Workshop took place in February 2018 in Berlin and the second one in January 2019 in Aix-en-Provence. To explore the Common Capability Challenges two scenarios were considered: landscape fire crisis mitigation (response) and landscape vulnerability mitigation (policy, prevention and preparedness). For more information on the progress in TWG C please visit the project’s e-platform.
D: Natural hazard mitigation:

In this area changing environmental conditions (climate, demographic and technological changes) require strategic analysis and constant revision of the status quo of crisis mitigation and its effectiveness as well as a good analysis of technical and operational solutions at hand. Specific challenges include:

- A specific focus on prevention;
- Education of a new generation;
- Working with the most adequate tools.

The 1st TWG D Workshop took place in February 2018 in Berlin and the second workshop in February 2019 in Praha. To explore the Common Capability Challenges the scenarios considered were: floods, flash floods and severe winter storms. For more information on the progress in TWG D please visit project’s e-platform.

E: CBRNE crisis mitigation:

This area has to deal with long and short-term effects of CBRNE incidents. Specific challenges include:
- Identification of substances;
- Manufacturing, storage, transport and intentional release in terrorist attacks;
- Measures for preventing or mitigating the effects of accidents;
- Limiting short and long-term negative effects on living organism’s ant the environment (air, soil, surface water and groundwater);
- Specific incident command system;
- Cooperation and joint standard operation procedures for different services;
- Intervention tactics and decontamination;
- Medical intervention tactics and decontamination (first aid in the contaminated field);
- Training.

The 1st TWG D Workshop took place in February 2018 in Rome and the second workshop in February 2019 in Praha. To explore the Common Capability Challenges in the frame of CBRNE accidents the scenarios considered were: an accident with a hazardous material during transportation were people are involved and the use of CBRN agent in a terrorist attack. For more information and conclusions of the 1st TWG E Workshop visit project’s e-platform.

One of the current important project discussion is the Common Capability Challenges Matrix which is produced to limit and focus the scope of further work.
**Common Capability Challenges Matrix**

<table>
<thead>
<tr>
<th>Incident Command Organization</th>
<th>Sustainability of operations</th>
<th>Reducing vulnerability to anticipated scenarios</th>
<th>Distribute decision-making</th>
<th>Stratègies choosing safe, resilient scenarios.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Cycle</td>
<td>Train specific roles and risks</td>
<td>Organizational learning on scenarios.</td>
<td>Shared understanding</td>
<td>Capacity building towards resilient societies</td>
</tr>
<tr>
<td>Community involvement</td>
<td>Self-protection to minimize responders’ exposure</td>
<td>Involve communities</td>
<td>____</td>
<td>Cultural changes in resilience to risk</td>
</tr>
<tr>
<td>Pre-planning</td>
<td>Preplan time-efficient and safe response</td>
<td>Anticipated scenarios with stakeholders</td>
<td>Enhance synergies &amp;Interoperability</td>
<td>Integral risk management.</td>
</tr>
</tbody>
</table>

- **CCC**
  - High flow of effort in hostile environment
  - Low frequency, high impact
  - Multiagency / Multileadership environment
  - High level of uncertainty
Summary

Fire-IN initiative aims at integration of European innovation activities in the area of Fire Safety and Rescue. The project so far involved 10 workshops in Rome, Berlin, Barcelona, Prague, Paris, Aix-en-Provence – which attracted 120 participants from 19 countries. The list of associated community experts currently includes approx. 400 individuals and it keeps growing, so please consider registering yourself at fire-in as an associated expert or a technology provider. Apart from the project website, the activity of the project can be followed on various social media channels like Facebook, Twitter, LinkedIn and YouTube.