

# White Paper

Enhancing Fire Safety:  
Fire Safety in Residential Environment

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## 1. Executive summary

Fire safety within the home is paramount, not just for the protection of those living there but also to ensure that any incident is swiftly managed, minimizing the loss of valuable possessions and emotional distress. Effective fire safety requires a comprehensive and holistic approach that goes beyond merely detecting fires; it involves prevention strategies and minimizing the impact of any incidents that occur. By identifying potential fire hazards and recommending practical solutions, this paper offers valuable insights for homeowners, families, fire professionals, and policymakers committed to creating safer living environments.

## 2. Introduction

Fire safety in homes is vital because residential environments pose unique risks due to the presence of highly flammable materials, electrical systems, and common human activities like cooking, smoking, and heating. Fires in homes can escalate rapidly, leading to devastating consequences, including loss of life, injury, and destruction of property.

Key Reasons why Fire Safety is Essential in Homes:

- **Human safety:** The primary concern of fire safety is protecting the lives of the occupants. Residential fires are a leading cause of accidental deaths worldwide, often occurring at night when individuals are asleep and may not detect the fire in time to escape. Smoke inhalation, rather than burns, is seen as the leading cause of fire-related deaths.
- **Frequency of residential fires:** Although information on fires is scattered, most fatal fires occur in homes. Based on available information (European Fire Safety Action Plan, European Fire Safety Alliance, 2020) around 5,000 people are killed every year in residential fires in Europe. Unfortunately, there are no official statistics available for most countries. In the USA, the National Fire Protection Association (NFPA) published that nearly 27% of the reported fires occur in homes, yet these account for nearly 80% of fire-related deaths. This demonstrates the elevated risk in residential settings compared to other environments.
- **Vulnerability of residents:** Children, the elderly, and those with disabilities are particularly vulnerable to fire. Their limited mobility and slower reaction times make early detection and quick response critical in homes.
- **Economic Impact:** Beyond the human toll, fires in homes lead to significant financial losses and long-term care for people impacted by a fire. This is besides the destruction of personal belongings, structural damage, and the cost of rebuilding can cause long-term economic hardship for homeowners and renters alike.
- **Legal and insurance implications:** Many governments and insurance companies mandate basic fire safety measures in homes, such as the installation of smoke alarms and, in some cases, sprinkler systems. Failure to comply can lead to legal penalties or the voiding of insurance claims after a fire.
- **Changing residential environments:** Modern homes contain more synthetic materials, which burn faster and produce more toxic fumes than natural materials. This increases the danger of rapid fire spread and makes early detection and suppression even more crucial.

In summary, fire safety is essential in homes to protect lives, prevent injuries, and minimize property damage. Awareness, early detection systems, fire prevention education, and other effective safety measures can drastically reduce the risks associated with residential fires.

The scope of this white paper is to address the several types of residential environments (houses, apartments, flats) and inform homeowners, housing corporations, owners' associations, building managers, policymakers, and fire safety professionals on a broad range of measures aimed at preventing accidents, reducing risks, and maintaining a safe living environment. A holistic approach that integrates fire prevention, preparedness, detection and rapid response forms the foundation of effective fire safety in residential settings.

### 3. Fire risks in residential environments

Maintaining a fire-safe home presents several challenges that demand proactive measures and heightened awareness. Beyond the topics discussed in the chapter, these challenges include:

- Rechargeable batteries: The growing use of rechargeable batteries in devices, electric bikes, and cars introduces additional fire risks.
- Energy storage systems (with lithium-ion batteries), which are increasingly being installed in new and existing buildings (both single-family homes and apartment buildings) as part of the obligation to use renewable energies.
- Urbanization: Increased urban density can delay emergency responses and complicate evacuation procedures.
- Lack of awareness: Many residents are not fully aware of fire safety protocols or the correct use of firefighting equipment, which can exacerbate the severity of fire incidents.

Some examples

#### 3.1 Electrical faults

Electrical fires are one of the leading causes of residential fires. These fires are often caused by outdated or faulty wiring, overloaded circuits, defective appliances, or improper use of extension cords. Homes with older electrical systems are at higher risk because they may not be equipped to handle modern electrical loads. Common triggers include overloaded outlets, faulty wiring, and defective appliances.

#### 3.2 Smoking

Cigarettes and matches that are not fully extinguished can ignite trash or other flammable items. Risks include smoking in bed, smoking near flammable materials and dropping a lit cigarette or match.

#### 3.3 Fires in Kitchen

The kitchen is the most common location for residential fires to start. Key factors include unattended cooking, grease fires and combustibles near heat sources.



#### 3.4 Flammable materials

Many household items, from cleaning supplies to furniture, can be highly flammable. Mismanagement of these materials increases the risk of a fire. Examples include flammable liquids, synthetic materials in furniture and improper storage of combustibles.

### 3.5 Misuse of heaters and faulty appliances

Heaters, especially portable space heaters, are often involved in residential fires when not used properly. Some of the most common hazards include proximity to flammable materials, overuse of extension cords, unattended operation, faulty Appliances, lack of maintenance and power surges and electrical faults.

### 3.6 The risk posed by modern materials

Modern materials, particularly in furnishings and façade cladding, pose significant fire risks in residential environments. Many contemporary household items, such as sofas, mattresses, and upholstered chairs, are made from synthetic fabrics, foams, and other materials that can be highly flammable. These materials often contain petroleum-based products, which can ignite quickly and produce intense heat, toxic fumes, and substantial amounts of smoke. In the event of a fire, synthetic furnishings burn more rapidly than natural materials like wool or cotton, reducing the time residents must escape.

One of the biggest concerns is the production of toxic gases like carbon monoxide and hydrogen cyanide, which are released when these materials burn. These gases can incapacitate residents before they can safely evacuate. Additionally, items treated with fire retardants, though designed to slow ignition, may still burn, and release harmful chemicals.

The increased presence of synthetic materials in modern homes has raised the stakes for fire safety. Ensuring proper fire detection systems, such as smoke alarms and heat detectors, and maintaining fire-safe behaviours, like not overloading electrical outlets and keeping flammable materials away from heat sources, are crucial steps in mitigating these risks in today's residential settings.

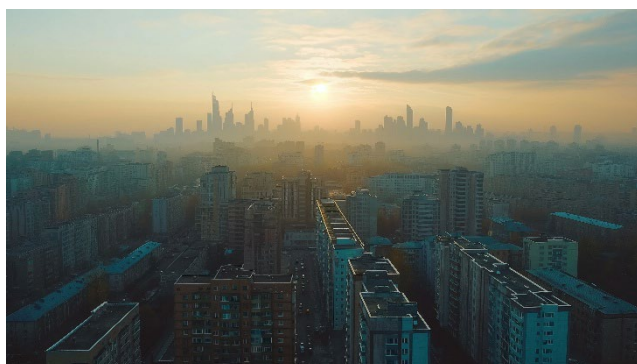
## 4. Specific risks in houses vs. apartments/flats

### 4.1 Single-family homes vs. multi-family dwellings

Fire risks in residential environments differ between single-family homes and multi-family dwellings due to structural design, occupancy density, and evacuation complexities.

In single-family homes, fire risks often stem from the use of electrical systems, appliances, and heating equipment. Homeowners may have more control over maintenance, but isolated homes can still present dangers if smoke alarms are poorly maintained or if flammable furnishings increase fire spread. Due to fewer occupants, detection times might be slower, delaying response.

On the other hand, multi-family dwellings, such as apartment buildings and flats, pose unique fire risks due to shared spaces, increased occupancy, and proximity of living units. Smoke from a fire can quickly spread from one flat to the public areas of the entire building, so that these can no



longer be used as escape and rescue routes. Thus, putting additional people and households at serious risk. Older buildings may have outdated wiring or unsuitable fire-resistant building materials, while newer buildings may present new risks such as rooftop photovoltaic panels or energy storage systems installed in less frequently visited rooms. Evacuation can be more challenging in multi-family buildings, especially in high-rises where stairways and exits may become congested.

Both housing types require robust fire safety measures, but multi-family dwellings especially benefit from stringent fire codes, shared emergency plans, and regular inspections to mitigate the compounded risk that comes with housing numerous families under one roof.

#### 4.2 Impact of shared walls and communal spaces in apartments/flats

Fire safety in apartments and flats is crucial due to the unique challenges posed by shared walls and communal spaces. Shared walls can facilitate the rapid spread of fire and smoke between units, making it essential for buildings to have robust fire-resistant materials, fire-barriers and fire-doors. Proper insulation and fireproofing of walls can significantly slow down the spread, giving residents more time to evacuate and firefighters more time to respond.

Communal spaces, such as hallways, stairwells, and lobbies, serve as critical evacuation routes. These areas must be kept clear of obstructions and flammable materials and equipped with clearly marked exits and emergency lighting. Regular maintenance and inspections ensure that fire alarms, sprinklers, and extinguishers are in working order.

Additionally, communal spaces often house electrical systems and other utilities that can be potential fire hazards. Ensuring these systems are up to code and regularly inspected can prevent fires from starting in the first place.

Residents should also be educated on fire safety practices, such as not blocking fire exits, reporting hazards, and knowing the building's evacuation plan. By addressing these aspects and raising awareness, the risk of fire-related incidents can be minimized, ensuring a safer living environment for all residents.

#### 4.3 Role of emerging technologies

Innovative technologies such as batteries, electric vehicles (EVs), and smart devices have revolutionized modern living but also introduce new fire safety risks.

**Batteries**, especially lithium-ion types, are widely used in smartphones, laptops, and other devices. While efficient, they can overheat, leading to thermal runaway and potential fires. Proper usage, avoiding overcharging, and using certified chargers can mitigate these risks.

**Electric vehicles (EVs)** come with large battery packs that, if damaged or improperly charged, can pose significant fire hazards. EV fires can be challenging to extinguish due to the high energy density of the batteries. Ensuring a proper charging infrastructure and regular maintenance are crucial for safety.

**Smart devices** like home assistants, smart plugs, and IoT devices often operate continuously and can overheat if not properly ventilated. Additionally, these devices are connected to the internet, making them susceptible to cyber-attacks that could potentially disable safety features or cause malfunctions.

**Solar panels:** While solar panels are safe, they do introduce some fire risks if not professionally installed and properly maintained. Common causes of solar panel fires include design flaws, component defects, and faulty installation. Overheating, electrical arcing, and short circuits can occur, especially if the panels are not correctly wired or if there is damage from extreme weather. To minimize these risks, it is crucial to use certified installers, follow manufacturer guidelines, and conduct regular inspections. Proper installation and maintenance significantly reduce the likelihood of fires, making solar panels a safe and sustainable energy option for homes.

To address these risks, it is essential to follow manufacturer guidelines, use devices as intended, and ensure regular maintenance. Installing smoke detectors and having fire extinguishers readily available can also enhance safety. By being aware of these new risks and taking appropriate precautions, we can enjoy the benefits of modern technology while minimizing potential hazards.

## 5. Regulatory landscape

### 5.1 Local and international fire safety standards

Fire safety standards are essential for ensuring the safety of buildings and their occupants. Both local and international standards provide guidelines and regulations to prevent, detect, and respond to fires.

Local fire safety standards are specific to individual countries or regions and are often enforced by local authorities. They include building codes, fire safety regulations, and inspection protocols. International fire safety standards aim to create a unified approach to fire safety across different countries. The International Fire Safety Standards Coalition (IFSSC) has developed the International Fire Safety Standards -- Common Principles (IFSS-CP), which provides a performance-based framework applicable throughout a building's life cycle. These principles focus on prevention, detection and communication, occupant protection, containment, and extinguishment.

Adopting both local and international standards ensures a comprehensive approach to fire safety, enhancing the protection of people, property, and the environment. By adhering to these standards, buildings can achieve higher safety levels, reducing the risk and impact of fire incidents.

### 5.2 Building codes

Building codes are essential for ensuring fire safety in residential buildings. These codes provide guidelines and regulations for the design, construction, and maintenance of buildings to protect occupants from fire hazards.

**Local Building Codes:** These are specific to municipalities or regions and are enforced by local authorities. They address various aspects of fire safety, including the use of fire-resistant materials, installation of fire alarms, and the provision of emergency exits. Local codes often incorporate standards from national or international bodies but may also include additional requirements based on local conditions and risks.

**National Building Codes:** These are established by national authorities and provide a standardized approach to fire safety across the country, which may set out comprehensive fire safety requirements for buildings. National codes ensure consistency in fire safety practices.



These codes should be updated regularly to reflect modern technologies and research findings.

Both local and national building codes play a crucial role in minimizing fire risks. They ensure that buildings are constructed and maintained to high safety standards, protecting lives and property. Compliance with these codes is mandatory, and regular inspections are conducted to enforce adherence. By following these codes, communities can significantly reduce the incidence and impact of fires.

Fire safety codes for houses and multi-dwelling units (MDUs) differ significantly due to the unique risks and requirements of each type of residence.

### 5.3 European and global standards

European and global fire safety standards, such as EN and ISO, play a crucial role in ensuring the safety of buildings and their occupants. The European Standards (EN), which are widely adopted across Europe are developed by the European Committee for Standardization (CEN) whereas the International Organization for Standardization (ISO) sets global benchmarks for international fire safety.



Both EN and ISO standards aim to harmonize fire safety practices, ensuring consistency and reliability. By adhering to these standards, buildings can achieve higher safety levels, reducing the risk and impact of fire incidents. These standards are regularly updated to incorporate innovative technologies and lessons learned from past incidents, ensuring they remain relevant and effective.

### 5.4 Construction Products Regulation: Impact on fire safety regulations

The Construction Products Regulation (CPR), formally known as Regulation (EU) No 305/2011, plays a pivotal role in enhancing fire safety regulations across Europe. The CPR establishes harmonized conditions for the marketing of construction products, ensuring they meet specific performance standards, including fire safety.

One of the key impacts of CPR on fire safety is the introduction of stringent requirements for construction materials. For instance, the regulation mandates that products used in buildings must undergo rigorous testing to determine their fire resistance and reaction to fire. This ensures that materials like insulation, cladding, and cables meet high safety standards, reducing the risk of fire spread.

CPR also facilitates a unified approach to fire safety across EU member states by providing common technical language for assessing product performance. This harmonization helps eliminate discrepancies between national regulations, ensuring a consistent level of safety throughout Europe.

Moreover, CPR supports the green and digital transition in the construction sector by promoting the use of sustainable and innovative materials. This includes incorporating fire safety considerations into the development of new products, thereby enhancing overall building safety.

In summary, the CPR significantly strengthens fire safety regulations by ensuring that construction products meet high performance standards, fostering a safer built environment across Europe.

## 5.5 Electrical installation regulations

Electrical equipment and installation are amongst the most common causes of fire in residential buildings. In order to maintain satisfactory electrical safety including fire safety, national regulations for electrical low voltage installations give rules for the design, erection and verification for construction of domestic electrical installations such as wiring and cabling.

National regulations may also set requirements for additional safety by defining and requiring safety equipment and devices. For instance, stove guards in compliance with EN 50615<sup>1</sup>.

## 6. Prevention strategies

### 6.1 Single Family Homes

Preventing fires in houses and homes involves a combination of proactive measures and regular maintenance. If there are specific national, regional or local fire protection regulations, these must be followed. Here are the main measures:

- **Install smoke alarms:** Place smoke alarms on every level of a home, at least in every bedroom and in each corridor that is to be used as an escape route. Test them regularly, e.g. monthly, according to the manufacturer's instructions. If batteries are replaceable, then replace them once a year.
- **Install CO alarms:** A carbon monoxide (CO) alarm in a home is crucial for preventing poisoning caused by CO that may escape from heating appliances, flues or fireplaces in the event of defects or blockages. A CO alarm reliably alerts the residents to dangerous levels of this odorless, colorless gas, ensuring the family's safety.
- **Fire extinguishers:** Keep fire extinguishers in key areas like the kitchen, garage, and near fireplaces. Ensure everyone in the household knows how to use them. Keep a fire blanket close at hand in the kitchen to safely extinguish grease or oil fires on the stove. Training of potential users and proper maintenance - or replacement after expiration date - is paramount.
- **Safe cooking practices:** Never leave cooking unattended. Keep flammable items away from the stove and use a timer to remind you when food is cooking.
- **Install stove guards:** Install a stove guard in a kitchen to prevent accidental fires and burns in the kitchen.
- **Electrical safety:** Regularly inspect electrical cords and replace any that are frayed or damaged. Avoid overloading outlets, do not plug multiple socket outlets into one another and use surge protectors.
- **Heating equipment:** Keep flammable materials away from heaters and fireplaces. Have heating systems inspected annually by a professional.
- **Escape plan:** Develop and practice a fire escape plan. Ensure every occupant knows at least two ways out of each room and a designated meeting spot outside.



<sup>1</sup> EN 50615:2015 - Household and similar electrical appliances - Safety - Particular requirements for devices for fire prevention and suppression for electric hobs (cooktops)). Category B devices perform preventive power cut-off of the appliance.

- **Proper storage:** Store flammable materials like gasoline and paint in approved containers and away from living areas.

By implementing these strategies, the risk of fire can be significantly reduced to ensure the safety of residents. Regular maintenance and awareness are key to effective fire prevention.

## 6.2 Multi Dwelling Units

Fire safety in apartment buildings and flats is critical due to the high occupancy and shared spaces. Here are some key measures and considerations. If there are specific national, regional or local fire protection regulations, these must be followed.

- **Smoke alarms and fire detection:** Ensure that smoke alarms are installed in every unit, at least in every bedroom and in each corridor that is to be used as an escape route to the entry door and in communal areas. Regularly test and maintain these alarms to ensure they are functioning correctly.
- **Fire extinguishers and sprinkler systems:** Equip buildings with fire extinguishers and/or automatic fire fighting systems. These should be easily accessible and regularly inspected.
- **Escape routes:** Clearly mark and maintain escape routes, including stairwells and emergency exits. Ensure these paths are free from obstructions and well lit.
- **Fire drills and evacuation plans:** Conduct regular fire drills and ensure all residents are familiar with the building's evacuation plan. This includes knowing the location of exits and assembly points.
- **Fire-resistant materials:** Use fire-resistant materials in the construction and furnishing of the building. This can help contain fires and prevent them from spreading quickly.
- **Electrical safety:** Regularly inspect electrical systems and appliances to prevent electrical fires. Address any issues promptly and avoid overloading circuits.
- **Resident education:** Educate residents on fire safety practices, such as not blocking fire exits, reporting hazards, and knowing how to use fire extinguishers.

By implementing these strategies, apartment buildings and flats can significantly reduce the risk of fire incidents and ensure the safety of all occupants.

## 7. Fire detection and suppression technologies

### 7.1 Smoke and Heat Detectors

Smoke and heat detectors are essential safety devices that can save lives by providing early warnings of fire and dangerous gas levels. Here is a brief overview of their technology and best practices for installation:

**Smoke Detectors:** These devices use photoelectric sensors to detect smoke particles. Install smoke detectors on every level of your home, inside bedrooms, and outside sleeping areas. Smoke detectors should be tested monthly and maintained in accordance with the manufacturers' instructions.

**Heat Detectors:** These devices detect rapid increases in temperature and / or when a certain maximum temperature is reached and are ideal for areas where smoke detectors may cause false alarms, due to possible deception such as kitchens and garages. Install heat detectors in these specific areas to complement your smoke detectors.

## 7.2 Sprinkler systems

A home sprinkler system automatically detects heat and extinguishes fires, minimizing damage and increasing safety. Sprinklers generally activate individually when heat from a fire reaches a specific temperature, releasing water directly onto the flames. This system is highly effective in preventing fire spread and protecting lives and property. Therefore, they are mandatory in some regions for apartment buildings. To ensure fire detection as early as possible, it is recommended to use them in combination with fire alarms.

## 7.3 Interconnection of alarms

Early warning is vitally important to provide occupants sufficient time to be able to evacuate the property. This is best achieved by interconnection of alarms.

## 7.4 Domestic Hazard Warning Systems.

Domestic Hazard Warning Systems enhance residential safety overall by ensuring safe communication and interaction between systems that are installed in your home. Thus, smoke alarms, CO alarms, intrusion and hold-up systems, stove guards, lighting, heating, social alarms can work together whilst being still independent systems. Even a smart home application can be integrated and contribute by sending notifications to your smartphone, allowing you to respond quickly, even when you are away.

# 8. Fire safety in residential settings with more significant risks

## 8.1 Older Buildings and renovations

Older buildings and renovations pose higher fire risks due to outdated electrical systems, poor insulation, and the use of flammable materials. Renovations can introduce additional hazards, such as faulty wiring and improper installation of heating equipment. Changes in space distribution and the addition of new electrical appliances can further increase fire risks. To mitigate these dangers, it is crucial to update electrical systems, use fire-resistant materials, and ensure proper installation of new equipment. Regular inspections and adherence to modern fire safety standards can significantly reduce the risk of fire in older homes and during renovations. Additionally, older buildings may lack adequate escape routes and compartmentalization to prevent fire spread. Addressing these issues requires comprehensive risk assessments, professional guidance, and adherence to current fire safety standards. Regular maintenance and upgrades are essential to enhance safety while respecting the building's architectural integrity.

## 8.2 Tall/high rise buildings

Fire safety in high-rise buildings presents unique challenges due to their height and complexity. Evacuation can be difficult, as elevators are typically unusable during fires, forcing residents to use stairwells, which can become congested. The vertical spread of fire and smoke is another concern, as it can move quickly through shafts and stairwells. Water pressure issues can also hinder firefighting efforts on upper floors. To address these challenges, high-rise buildings require robust fire protection systems, regular fire drills, and clear evacuation plans to ensure the safety of all occupants.

## 8.3 Housing with vulnerable populations

Residential fire safety poses significant challenges for vulnerable populations, including the elderly, people with disabilities, and those with chronic illnesses. These individuals often have limited mobility, impaired senses, or cognitive difficulties, making it harder to detect and respond to fires by rescuing themselves. Additionally, they might rely on caregivers who need to be well-versed in fire safety protocols. Ensuring accessible fire alarms, clear evacuation routes, and conducting regular safety drills can help mitigate these risks. Tailored education and support are crucial to enhance fire safety for these at-risk groups, ensuring they can evacuate safely in an emergency.

# 9. Case Studies

Real-life examples of successful implementation of domestic safety measures:

1. The widespread installation and use of **smoke alarms** in households has significantly reduced the risk of fire-related fatalities. These devices promptly alert residents to the presence of smoke, allowing them to take immediate action and evacuate safely. Kitchen **fires** are a leading cause of household accidents, often resulting from unattended cooking and grease build-up. Stove guards, equipped with heat sensors and automatic shut-off mechanisms, offer an effective preventive measure. These devices help mitigate the risk of stove-related fires, ensuring enhanced safety and peace of mind in the kitchen.
2. Many households have implemented **security cameras and smart locks**, enabling residents to monitor their homes remotely and control access points, thereby deterring potential intruders and enhancing overall security.
3. Preparedness measures such as **home emergency kits** containing first aid supplies, flashlights, and emergency contact information have proven invaluable during natural disasters or unforeseen emergencies, ensuring that households are equipped to handle challenging situations effectively.

Examples from case studies around fire safety in residential homes and high-rise buildings:

1. **Fire dynamics in multi-story residential structures:** This study by the Fire Safety Research Institute (FSRI) explores fire dynamics and firefighting tactics in townhomes and rowhomes. <https://fsri.org/>
2. **Search and rescue tactics in single-story homes:** FSRI conducted experiments in single-story, single-family homes to examine the impact of different search and rescue tactics. <https://fsri.org/>

3. **Fire safety in a residential building:** A case study presented in a research paper assessed the compliance of a residential building with passive and active fire safety systems. [SCISPACE](#)
4. **Fire evacuation in high-rise buildings:** A review of human behavior and modeling research in high-rise buildings examined the effectiveness of different egress components, such as stairs and elevators, during fire evacuations. [SpringerOpen](#)
5. **Stay-put tactic in high-rise buildings:** This study analyzed the stay-put tactic used by fire and rescue services during high-rise building fires. [MDPI.com](#)
6. **Fatal residential fires in Europe:** This study by the European Fire Safety Alliance (EuroFSA) and the Dutch Fire Service Academy analyzed data from nine European countries to identify risk factors and improve fire safety measures. [EFSA.com](#)
7. **Energy retrofit and fire protection in high-rise buildings:** A case study in Modena, Italy, examined the impact of energy retrofits on fire safety. [Springer.com](#)
8. **Integrated fire safety strategies for high-rise buildings:** This paper analyzed various high-rise buildings to identify critical elements and design approaches for fire safety. [www.ijnrd.org](#)

These case studies provide valuable insights into the complexities and strategies of fire safety in various residential settings across Europe.

Here are five European success stories that highlight improvements in fire safety for residential homes and high-rise buildings:

1. **Grenfell Tower Reforms, UK:** Following the tragic Grenfell Tower fire in 2017, the UK implemented significant reforms, including the ban on combustible cladding for high-rise buildings and the introduction of stricter building regulations. These changes have greatly enhanced fire safety standards across the country. [Fire Safety in High-Rise Buildings](#)
2. **European Fire Safety Action Plan:** The European Fire Safety Alliance (EuroFSA) developed an action plan that includes measures such as mandatory smoke alarms, fire-safe cigarettes, and public awareness campaigns. These initiatives have led to a significant reduction in residential fire incidents across participating countries. [EFSA Fire Action Plan](#)
3. **Keep EU Fire Safe, Brussels;** joint European industry **initiative** which provides policy makers with a Manifesto asking more attention from the **European Parliament**, Council and European Commission on fire safety, with a focus on residential environment [KeepEUfiresafe | Call for a EU fire safety strategy](#).
4. **Burn prevention: success stories and lessons learned.** [EFSA.com](#)

## 10. Cost-benefit analysis of fire safety measures

Investing in fire safety measures, like smoke alarms, sprinkler systems, and fire extinguishers, offers significant benefits. The initial costs are outweighed by the potential savings in lives, property, and reduced insurance premiums. Effective fire safety measures can prevent devastating losses, making them a cost-effective investment for both homes and businesses.

## 11. Regulatory and policy recommendations

### 11.1 Analyzing existing regulatory frameworks for domestic safety standards

Fire safety and building codes in European countries are governed by a combination of national regulations and standards, as well as directives and regulations established by the European Union (EU). While specific requirements can vary between individual countries, there are overarching principles and guidelines that are commonly followed to ensure the safety and well-being of residents.

In the European Union, the Construction Products Regulation (CPR) establishes harmonized standards for the fire performance of construction products, aiming to enhance fire safety in buildings. This regulation requires that construction products meet essential safety requirements, including those related to fire safety, before they can be placed on the market.

Furthermore, European countries typically implement building codes that outline specific fire safety measures for several types of structures. These codes often address critical aspects such as fire-resistant construction materials, compartmentalization to prevent the spread of fire, the installation of fire alarms, sprinkler systems, and emergency exits, as well as guidelines for the safe use of flammable materials.

In addition to these regulations, many European countries conduct regular fire safety inspections and assessments to ensure that buildings comply with the established codes. Inspections may include checks on the functionality of fire protection systems, adherence to evacuation protocols, and the presence of adequate fire safety equipment.

For the most accurate and up-to-date information on fire safety and building codes in specific European countries, it is advisable to refer to the national building authorities and fire safety regulatory bodies of the respective countries.

### 11.2 Proposed policy changes

Enforcing mandatory safety measures for residential buildings requires a comprehensive approach that prioritizes the well-being of residents. Here are some ideas for proposing policy changes:

- Introduce Legislation for **mandatory safety inspections**: Implement a policy requiring regular safety inspections for all residential buildings to ensure compliance with fire safety, structural integrity, and health standards.
- Develop and **establish** a set of comprehensive and **clear safety standards** that cover fire prevention, structural stability, electrical safety, and other critical areas, and make them legally binding for all residential properties.
- Mandate the **installation of essential safety equipment** such as fire alarms, carbon monoxide detectors, sprinkler systems, and emergency lighting in all residential buildings to enhance preparedness and response during emergencies.
- Foster and **encourage community awareness** and engagement by organizing workshops, seminars, and training programs to educate residents about safety protocols, emergency preparedness, and the importance of adhering to safety measures.

- Offer **incentives** to building owners who proactively implement safety measures, while enforcing **penalties** for non-compliance to encourage adherence to safety regulations and ensure accountability.
- **Strengthen** the **capacity** and resources **of regulatory agencies** responsible for monitoring residential building safety to enable more rigorous enforcement and regular follow-up on safety compliance.

By implementing these policy changes, it is possible to establish a robust framework that prioritizes the safety of residents and ensures that residential buildings adhere to the highest safety standards, fostering secure and resilient communities.

### 11.3 Importance of government initiatives

Highlighting the importance of government initiatives in promoting domestic life safety involves emphasizing the critical role of policy and support in fostering secure living environments. Here are some ideas to underscore this significance:

- **Public awareness campaigns:** Launch targeted public awareness campaigns to educate communities about the importance of domestic safety and to highlight the government's efforts in implementing policies that prioritize residents' well-being.
  - Euralarm contributes** through promoting and educating fire safety awareness via the Euralarm communication channels, website, LinkedIn, and meetings.
- **Showcasing success stories:** Highlight successful case studies and examples where government initiatives have effectively improved residential fire safety, showcasing how these measures have positively impacted communities and saved lives.
  - Euralarm contributes through** publication of fire safety related topics, organize free webinars and promote a holistic approach of fire safety
- **Collaborative partnerships:** Foster partnerships between government agencies, non-profit organizations, and local communities to demonstrate the collective effort and commitment to enhancing residential fire safety through collaborative initiatives and joint programs.
  - Euralarm contributes through** working together with other European associations in a constructive way and supporting the European Manifesto on fire safety.
- **Policy impact assessment:** Conduct comprehensive assessments and studies to analyze the impact of existing government policies on residential fire safety, providing empirical evidence of the positive outcomes and underscoring the need for continued support and investment in this area.
  - Euralarm contributes** to policy impact assessments **through providing** expert insights and position papers that help shape regulations and standards, ensuring they add value to fire safety.
- **Empowering local authorities:** Empower local authorities by providing them with resources, training, and support to implement and enforce residential fire safety regulations effectively, emphasizing the vital role of decentralized governance in ensuring the safety of households.
  - Euralarm contributes through** providing guidance, resources, and expertise to enhance fire safety and security measures, ensuring communities are better protected and more resilient.



- **Advocacy for legislative reforms:** Advocate for legislative reforms and amendments that prioritize domestic life safety/residential fire safety, highlighting the importance of regulatory frameworks that enable proactive safety measures and foster a culture of preparedness and prevention.

**Euralarm contributes through** advocating for legislative reforms by engaging with policymakers, providing expert recommendations, and promoting regulations that enhance fire safety standards across Europe and take fire safety into account when implementing new directives and regulations.

### 11.5 Euralarm Activities to improve residential fire safety

With the establishment of the Domestic Life Safety group Euralarm extended its work that has been done over the last decades on commercial fire safety into the residential market. This was triggered by the changes in the way we live, work and travel and the transformation which is ongoing in Europe. Among others, this transformation is initiated by the Green Deal, the Europe-wide electrification, the aging population, and urbanization. Euralarm with their members in fire safety, extinguishing and security considers it as its task to contribute to a more safe and secure Europe.

### 11.6 Promoting a holistic approach on fire safety

Promoting awareness and education about potential risks and preventive measures is pivotal in fostering a culture of safety within households. Conducting workshops, distributing informational pamphlets, and utilizing digital platforms to disseminate information about fire hazards, electrical safety, and fire safety risks cultivates a proactive approach to risk prevention. Educating individuals about the dangers of toxic substances, proper storage of hazardous materials, and the importance of ventilation supports a healthy living environment. Teaching the significance of maintaining clear escape routes, installing smoke and CO sensor, stove guards and fire extinguishers. By empowering residents with knowledge and resources, households can proactively mitigate risks and ensure a secure and resilient living space.

## 12. Conclusion

Improving fire safety at home is a collaborative effort that involves implementing effective safety measures, embracing advanced technologies, and fostering a culture of awareness and preparedness. By taking these steps, homeowners can significantly reduce the risks associated with fire, ensuring a safer living environment for all.

The fire safety of one's home is important for the people living in the home and next to it also to ensure that an incident can be controlled in time without a loss of emotional and valuable goods. Fire safety in a home needs a holistic approach, it is not only about detecting a fire incident but also to prevent incidents and keep the impact of an incident as limited as possible. By identifying potential fire risks and proposing effective solutions, this paper provides valuable insights for families, homeowners, fire professionals, and policymakers to create a fire safe living environment.

From installing robust fire detection systems, maintaining sturdy infrastructure, and promoting awareness about potential hazards, the significance of domestic life safety cannot be overstated. By fostering a culture of preparedness and adherence to safety protocols, it not only minimizes the

occurrence of life-threatening incidents but also cultivates a sense of peace and reassurance within households.

The integration of advanced technologies, coupled with educational initiatives and community engagement, serves to underscore the importance of proactive measures in safeguarding the sanctity of domestic life. Ultimately, the collective effort to prioritize and uphold domestic life safety serves as a testament to the commitment to nurturing a secure and resilient foundation for individuals and families to thrive within the comfort of their own homes.

By implementing these ideas, it is possible to effectively highlight the significance of government initiatives in promoting domestic life safety, underscoring the pivotal role of policy and collective action in creating secure and resilient communities.

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