Study on illegal sales of pyrotechnic articles destined for professional users (category F4) to the general public

Final Report

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ABSTRACT

In response to mounting evidence that F4 pyrotechnics intended for use by professional users only were reaching the general public through non-compliant (online) sales channels, the European Commission decided to launch this study to provide an assessment of the trends around the illegal sales in the EU, establish if and how (online) web-shops control that the purchaser is a professional user with recognised specialist knowledge, and understand if there are gaps and weaknesses in the existing legal and enforcement arrangements.

The evidence examined led to the finding that seemingly 73% of web-shops that sell F4 pyrotechnics online make available such articles to the general public without implementing any necessary controls. Moreover, the non-authorised use of F4 (and F3) pyrotechnics were reported as causing serious harm to property and persons, with the articles typically purchased online from non-compliant web-shops based physically in other Member States. In addition, official inspections have detected that pyrotechnics have been couriered to the homes of consumers in unlabelled parcels in clear breach of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), therefore representing a serious safety risk to postal and courier companies.

Thus, the study determined that the relevant articles of the Directive 2013/29/EU[1] were not enforced fully, and recommended the Commission and Member States to introduce a combination of policy measures to strengthen the current cross-border and national enforcement efforts, and legal reforms to reinforce the Directive and national penalties. If implemented fully, a significant reduction in the non-compliant sale and unauthorised use of F4 pyrotechnics would likely occur.

[1] Directive 2013/29/EU of the European Parliament and of the Council of 12 June 2013 on the harmonisation of the laws of the Member States relating to the making available on the market of pyrotechnic articles (recast)

EXECUTIVE SUMMARY

Background to the study

Following other retail markets, the pyrotechnics sector has established an extensive online retail presence making it possible for EU consumers to purchase pyrotechnic articles from web-shops based physically across the internal market.

This trend has also given rise to an increasing number of reports received by the European Commission indicating that fireworks categorised as F4 pyrotechnic articles were reaching the general public, nonetheless, the Pyrotechnic Articles Directive 2013/29/EU provides that these articles should only be sold to and used by professional users recognised as having specialist knowledge.

Moreover, the non-authorised use of F4 pyrotechnics has caused concern considering the severity of some of the accidents documented and in instances where their misuse has been associated with the criminal intent to harm persons or damage property.

In response to these findings, in 2016, the European Commission launched a study to review the economic production and supply of F4 flash bangers, considered as one of the most problematic articles. Among other things, the study confirmed that these items were entering the hands of the general public by online sales channels, and that their level of production outstripped their known level of professional use.[2]

Given that it was confirmed that the requirements of Directive 2013/29/EU were not being applied fully, to investigate this issue further, the European Commission decided to launch this study with the aims of:

1. Providing a qualitative and where possible quantitative assessment of the problem of illegal sales of F4 fireworks in the EU;

2. Establishing if and how sellers control that the purchaser is a person with specialist knowledge in his Member State of residence, with a view to identifying problems in verifying that a person has the necessary credentials;

3. Understanding which elements and problems (be it a national or a European issue) can facilitate incidental or intentional diversion of F4 fireworks to members of the general public;

4. Understanding if there are gaps or weak elements in the current system (and if there are, which ones) that could be solved at either the EU or national levels;

Study methodology

To gather the necessary data to address the questions above, EU Member State interview and online survey programmes were conducted. The participants mainly included competent authorities, market surveillance authorities, law enforcement authorities, Notified Bodies, EU and national industry associations, and postal and courier services companies. This information was then screened and synthesised to produce a series of key messages reflecting the general views of the stakeholder population per question.

[2] DJS Research (2016) F4 Flash Bangers in EU Member States: Study on production, import and use in the EU of high risk pyrotechnic articles categorised F4 according to Directive 2007/23/EC and Directive 2013/29/EU.

Moreover, the study undertook a comprehensive mapping exercise of 310 online pyrotechnics web-shops managed by a pyrotechnics expert to determine if it was possible to purchase F4 pyrotechnics without undergoing specialist knowledge controls.

In addition, to inform an analysis of the negative cost impact of the misuse of pyrotechnics, firework injury data were analysed from two sources.[3]

The non-compliant sale and use of F4 pyrotechnics are largely hidden from the authorities, making this subject area difficult to research

A study limitation was that it was difficult to determine the overall scale of the problem considering that much of the non-compliant sales activity takes place online, with the parcels sent to the home addresses of consumers in unmarked parcels.

Therefore, while many authorities were aware of the non-compliant activities, the extent of the recognition of the national scale of the problem varied significantly between the Member States.

There were no doubts that some countries have experienced very limited problems in terms of non-authorised usage of F4 pyrotechnics by consumers, however, the extent of the sales activities across the internal market due to a major non-compliant web-shop, as determined by the Polish police during a recent investigation, suggested extensive illegal sales activities across the EU, please see the following section.

Without further detailed information from this investigation, currently, it seemed possible to suggest that many national authorities were not aware of the true extent of this problem.

Cross-border enforcement actions to shut down non-compliant web-shops have commenced

In the early stages of this study, in December 2018, a coordinated investigation effort involving Europol, Eurojust and national authorities resulted in a major police raid of four web-shops managed by an Organised Crime Group (OCG) based in Poland.

The scale of the problem of the non-compliant sale of F4 pyrotechnics is reflected in the amount of materials seized by the Polish police. In a warehouse managed by one of the web-shops, 80 tonnes of F4 pyrotechnics were discovered, enough to fill four large shipping containers. After assessment of the evidence, it was estimated that this OCG shipped 1000 kg of F1 to F3, and 500 kg of F4 pyrotechnics to different Member States per day.

In addition to supplying F4 pyrotechnics to the general public without the necessary specialist knowledge controls, it was found that this OCG did not have the mandated credentials to handle or store F4 pyrotechnics, and was also engaging in money laundering activities.

However, despite this initial success, further cross-border and national actions are needed to stamp-out the remaining (online) sources that facilitate diversion of F4 pyrotechnics to the general public, as determined by this study.

About 73% of companies that supply F4 pyrotechnics online do so seemingly without implementing specialist knowledge controls

[3] The data sources included: national data provided to the Commission since 2013 and the European Injury Database funded by the Commission. As explained in more detail in Chapter 5, both data-sets include some shortcomings e.g. data are available for some EU countries only, and annual data were not reported for some of the years by some countries etc.

A key activity performed by the study was to review 310 pyrotechnics companies with an online presence across the Member States. Overall, the results suggested that 90% of the websites reviewed were compliant with the legal requirement of not making available F4 pyrotechnics to the general public.

However, based on the sample reviewed, about 73% of companies that supply F4 pyrotechnics online likely do so without implementing specialist knowledge controls, representing 32 companies (this does not include the Polish web-shops that were closed down by the police in December 2018). These companies were identified in Bulgaria (4 companies), Czechia (11), Greece (3), Italy (1), Lithuania (4), Luxembourg (1), the Netherlands (1), Poland (2), Romania (1) and Slovakia (4).

Notably, authorities and other stakeholders have underestimated the proportion of online retailers that sell F4 pyrotechnics online without specialist knowledge controls; the average online survey response suggested a figure of 16%, whereas, as mentioned, the figure derived from the analysis of the sample of companies was in the region of 73%.

In addition, some of these likely non-compliant web-shops offered features and services to facilitate sales of pyrotechnics across the internal market, including international shipment services and multiple website language versions. Further analysis revealed that the F4 pyrotechnics product ranges available to consumers online were highly extensive, suggesting high levels of black-market activity.

While online sources represent the main route for F4 pyrotechnics to enter consumer markets, other avenues were also identified often involving Organised Crime Groups

In-depth feedback received from interviewees confirmed that the supply of F4 pyrotechnics to the general public is largely driven by internet sales, where typically the web-shops were noted as being based in other Member States. However, other avenues for F4 pyrotechnics to reach the general public were highlighted, as follows:

- The authorities in Italy and elsewhere acknowledged that some of the F4 flash bangers manufactured by a licensed Italian producer(s) end-up in the hands of consumers illegally;
- Illegal manufacturing sites producing unlicensed pyrotechnics that have qualities similar to those certified as F4 pyrotechnics have also been detected occasionally in Austria, Denmark and Italy;
- OCGs have been noted to physically transport F4 pyrotechnics from Czechia and Poland to the Netherlands which have been subject to criminal investigations;
- Street market sales persons with links to OCGs were noted as key retailers of F4 pyrotechnics to the general public in Czechia;
- Small-scale criminal intermediaries and private persons undertaking cross-border shopping were highlighted as involved in distributing and using F4 pyrotechnics illegally;

According to (official) feedback, the non-authorised use of F4 pyrotechnics seems to be distributed unevenly across of the Member States, although many "high use" countries were identified

The responses suggested an uneven distribution of non-authorised usage across the Member States, with Austria, Czechia, Denmark, Germany, the Netherlands and Sweden appearing to suffer the most severe problems. This judgement was reached considering information received from interviewees, newspaper reports documenting police seizures and non-authorised use by the general public, and YouTube videos of dangerous usage of (F3/F4) pyrotechnics by the general public.

Unsurprisingly, in many cases, it seems that non-authorised use of F4 pyrotechnics (and in some cases F3 pyrotechnics where national law prohibits use of such articles by the public) is linked to the New Year's Eve celebrations. Moreover, in many cases, the (F4)

pyrotechnics are set-off using unorthodox methods and unsafe distances. In addition, it was mentioned that non-authorised usage is occasionally linked to criminal activities where the intention is damage property and harm persons.

Postal and EU-wide courier companies are worried that a serious accident could result from the mishandling of an unlabelled parcel containing (F4) pyrotechnics

Feedback received from postal and major EU-wide courier companies indicated that they are unable to prevent the anonymous use of their services by non-compliant web-shops. It was noted that the web-shops use several tactics to prevent themselves from being detected such as dropping-off their parcels for shipment at multiple sites, and using storage facilities in other countries as intermediary distribution points.

Moreover, this trend poses serious risks to postal workers and company property; in response, the companies interviewed have introduced measures to support the detection of the parcels and have been subject to official inspections.

In addition, the distribution of pyrotechnics contained in unmarked parcels is in clear breach of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), which mandates that appropriate labelling and packaging must be used, with the transportation of such goods managed by certified couriers etc.

There was general agreement that the requirements of the Directive relating to the sale and handling of F4 pyrotechnics were challenging to enforce, and that cross-border, and in some cases national, enforcement mechanisms were not operating optimally

It was highlighted that the main purpose of the Directive is to enable the free movement of pyrotechnic articles in the internal market, based on mandatory product essential safety requirements and a harmonised system of controlling that such requirements are met as a pre-condition for making them available on the EU market.

However, while the Directive does not permit the (cross-border) sale and use of F4 pyrotechnics to the general public, it has not been designed in a way to restrict cross-border crime.

For example, although the Directive mandates that users of F4 pyrotechnics must have the necessary specialist knowledge, the different national requirements and documentary evidence related to these qualifications makes it difficult for economic operators and authorities to conduct checks of professionals that have obtained their specialist knowledge from another Member State.

Moreover, while some countries do not seem to have non-compliant traders on their home market, others were recognised as being home to companies that were active in selling F4 pyrotechnics online from one Member State to another.

At the same time, cross-border cooperation to tackle the problem was said to be difficult although improving. Obstacles identified included:

- difficulties identifying the relevant counterparts in police authorities in other Member States that are open to following-up on case investigations;
- in some cases, the limited extent to which enforcement authorities consider the illicit sale and use of F4 pyrotechnics as a problem to address;
- and the absence of national legislation that makes the non-compliant sale of F4 pyrotechnics a criminal act.

Therefore, the enforcement of the Directive in a cross-border context was noted as facing significant obstacles.

The negative cost impact of the non-compliant sale and use of F4 pyrotechnics affects multiple stakeholders, including injured citizens, the legitimate pyrotechnics sector, market surveillance, police and health authorities, the postal and courier services industry, insurance companies and owners of private property

It was not the role of the study to quantify all negative cost impacts caused by the non-compliant sale and use of F4 pyrotechnics. However, the negative costs impacts were examined qualitatively and conceptualised as part of a causal chain, considering the negative effects that occur at the point of sale of the products, during their transportation, and when they are used by non-authorised members of the general public.

Multiple negative cost impacts due to the non-compliant sale and use of F4 pyrotechnics were identified, including the negative effects experienced by injured parties, unfair competition with the legitimate pyrotechnics sector, additional duties to be performed by market surveillance, police and health authorities, payments to be distributed by insurance companies etc.

To get an idea of the number of pyrotechnics accidents that have occurred, although the data is incomplete and not comparable between countries, 18 Member States have reported 6566 pyrotechnics accidents to the Commission over last five years. Moreover, some of the accidents have been reported in countries where it is recognised that there are problems with the non-compliant use of F4 fireworks (e.g. DK, NL, IT, SE). Although it is very difficult to estimate the costs of the health care provided to these individuals, the study suggested a possible figure of 23 million EUR.

Going forward, to address the problem, it is recommended that the Commission and Member States develop and implement a combination of policy measures focusing on the better enforcement of the existing rules both nationally and via cross-border mechanisms, and consider introducing new legal reforms to the Directive that help to limit the unlawful supply of F4 pyrotechnics and where needed making national penalties for such crimes more stringent

Using a multicriteria analysis, 4 Policy Options and sub-measures were examined to assess their potential performance in addressing the problem. Ultimately, it was determined that the optimum route forward would be to introduce a combination of complementary Policy Options.

Thus, to provide a meaningful response to the problem identified, it was suggested that the Commission and Member States should coordinate efforts to implement Policy Option 1 (better enforcement of the existing rules). This action should include:

- scaling-up cross-border and national market surveillance and law enforcement activities;

- strengthening the role of the AdCo group on Pyrotechnics, for example, by sharing information on enforcement actions that have collected evidence from retailers on whether the sales of F4 pyrotechnics have been conducted with persons with specialist knowledge, and launching a task force and inspection programme investigating online web-shop activities;

- Making use of existing Commission systems and market surveillance programmes to help facilitate and provide additional resources to support the market surveillance and law enforcement processes, namely the Information and Communication System on Market Surveillance (ICSMS) subject to reforms to permit sharing of information on non-compliant web-shops and the European Coordinated Activities on the Safety of Products Programme;

- Introduction of measures to ease ongoing cooperation and actions e.g. guidance that is updated periodically indicating the relevant EU authorities and

counterparts, enforcement standards and practices, evidence development methods, suggestions for the sharing of information; and the establishment of a specific EU Member States network to support ongoing coordination;

While the implementation of Policy Option 1 would create the enforcement conditions necessary to pose a significant problem to those that intend to break the law, these activities would be strengthened through the implementation of Policy Options 2 and 4. Therefore it is recommended that:

- Policy Option 2 (sub-option 1) is implemented to first introduce a template that can be used on a voluntarily basis of a harmonised form indicating that an individual with specialist knowledge has met the necessary standards to handle and use pyrotechnics in the country where the harmonised form was issued. If the use of such a harmonised form is well-received by a vast majority of Member States, the Commission could consider launching a legislative proposal to introduce the proposed harmonised form by amending the Directive. If it were decided to open the Directive, the requirement to retain a copy of the harmonised form by economic operators could be introduced in the legal text (although the use of this specific measure could also be encouraged through relevant guidance).

- Policy Option 2 (sub-option 2) is implemented to revise the Directive to enable Member States to prohibit or restrict the possession, use and/or the sale to the general public of category F4 pyrotechnics fireworks, which are justified on grounds of public order, security, health and safety, or environmental protection;

- Policy Option 4 is considered strongly by the Member States to encourage the introduction of stringent penalties for both prison sentences and fines using criminal law; in doing so, consideration should be given to the stiff penalties set

Contents

1. INTRODUCTION

1.1. Background to the Directive 2013/29/EU

The European Commission has introduced measures to ensure that a harmonised regulatory framework is established for the making available of pyrotechnic articles on the internal market.

In recent years, the introduction of Directive 2013/29/EU[1] (henceforth referred to as 'the Directive') brought about a substantial recast to its predecessor Directive 2007/23/EC, with the amendments introduced informed by the provisions of Regulation (EC) No 765/2008 and Decision No 768/2008/EC.[4][5][6][7][8]

Ultimately, the recast Directive continues its role of ensuring the free movement of pyrotechnic articles while safeguarding a high level of protection of human health, public security, and consumers, and the relevant aspects related to environmental protection.

In doing so, the Directive mandates that economic operators must fulfil their relevant obligations, ensuring that products made available on the market meet the necessary requirements.

To ensure that fireworks are placed on the market in accordance with the Directive, Notified Bodies are tasked to manage conformity assessment procedures in line with Annex II of the Directive, taking corrective measures where necessary if manufacturers submit non-compliant pyrotechnic articles.

Member States must also establish market surveillance authorities that have an enforcement role at national level, and a coordination role at European level, particularly where non-compliant (high hazard) pyrotechnic articles are identified in more than one national territory and in respect to cross-border sales.

Ultimately, Member States must take all appropriate measures to ensure that pyrotechnic articles, when placed on the market, do not endanger the health and safety of persons. National authorities responsible for the implementation of pyrotechnics legislation must also consider other national requirements, for example, those related to safe storage and usage of pyrotechnics.

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[4] Directive 2013/29/EU of the European Parliament and of the Council of 12 June 2013 on the harmonisation of the laws of the Member States relating to the making available on the market of pyrotechnic articles (recast)

[5] Directive 2007/23/EC of the European Parliament and of the Council of 23 May 2007 on the placing on the market of pyrotechnic articles

[6] Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products

[7] Decision No 768/2008/EC of the European Parliament and of the Council of 9 July 2008 on a common framework for the marketing of products

[8] Some of the key changes introduced by the Directive included strengthened rules for the accreditation and obligations of conformity assessment bodies, enhanced procedures for market, surveillance, tighter controls around the import of products from third countries, clearer principles, for the CE marking of products, and stronger and clearer obligations for different types of economic, operators according to their role in the supply chain e.g. 'manufacturers', 'importers', and 'distributors'.

1.2. Key requirements of the Directive (Article 6) relevant to this study

The Directive, Article 6, replicated the approach already adopted in the previous Directive 2007/23/EC of categorising fireworks according to their level of risk, considering issues such as the type of use, purpose, level of hazard, and noise level, and specified that fireworks must be approved as falling into one of the categories: F1 (very low hazard), F2 (low hazard), F3 (medium hazard) and F4 (high hazard).

Consumer fireworks falling into the F1 to F3 categories can be made available to members of the general public under certain conditions that differ according to the specific category. However, the Directive provides flexibility for Member States to introduce further restrictions relating to the use and sale of F2, F3 and other categories of pyrotechnics articles.[9]

Regarding the category of F4 pyrotechnics, Article 6 (a, iv) of the Directive specifies these as:

> *Category F4: fireworks which present a high hazard, which are intended for use only by persons with specialist knowledge (commonly known as fireworks for professional use) and whose noise level is not harmful to human health.*

Category F4 pyrotechnics are regarded as 'a high hazard' due to their explosive power, considering that there are no specified limits regarding their Net Explosive Content, unlike categories F1 to F3. The rules of the Directive permit that only Category F4 fireworks may contain detonative explosives other than black powder and flash composition subject to a series of requirements.[10] [11]

In addition, pyrotechnic articles are subject to labelling requirements, with category F4 pyrotechnics required to indicate among other things: "for use only by persons with specialist knowledge" and the specified "minimum safety distance".[12]

The Directive makes it clear that a "person with specialist knowledge" means a person authorised by a Member State to handle and/or use on its territory category F4 pyrotechnics. Member States are obliged to inform the Commission of the national procedures introduced to identify and authorise persons with specialist knowledge; and manufacturers, importers and distributors are obliged not to make available on the market the F4 pyrotechnics except to persons with specialist knowledge.

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[9] This Directive shall not preclude measures taken by a Member State to prohibit or restrict the possession, use and/or the sale to the general public of category F2 and F3 fireworks, theatrical pyrotechnic articles and other pyrotechnic articles, which are justified on grounds of public order, security, health and safety, or environmental protection.

[10] (a) the detonative explosive cannot be easily extracted from the pyrotechnic article;
(b) for category P1, the pyrotechnic article cannot function in a detonative manner, or cannot, as designed and manufactured, initiate secondary explosives;
(c) for categories F4, T2 and P2, the pyrotechnic article is designed and intended not to function in a detonative manner, or, if designed to detonate, it cannot as designed and manufactured initiate secondary explosives. 28.6.2013 EN Official Journal of the European Union L 178/47

[11] Pyrotechnics of category F4 must be protected against inadvertent ignition by methods specified by the manufacturer.

[12] The labelling of pyrotechnic articles shall include as a minimum the information about the manufacturer set out in Article 8(6) and, where the manufacturer is not established in the Union, the information about the manufacturer and the importer set out in Article 8(6) and Article 12(3) respectively, the name and type of the pyrotechnic article, its registration number and its product, batch or serial number, the minimum age limits set out in Article 7(1) and (2), the relevant category and instructions for use, the year of production for category F3 and F4 fireworks and, where appropriate, a minimum safety distance. The labelling shall include the net explosive content (NEC).

1.3. Background to the study

The rationale for this study was based on intelligence received by the Commission that F4 pyrotechnics were being sold online by non-compliant retailers to non-authorised members of the general public.

This was a cause for concern considering that in addition to key requirements of the Directive not being fulfilled, reports were received regarding severe accidents and damage to public and private property; some criminal cases were also noted where there was an intention by the non-authorised users to harm others or damage property using F4 pyrotechnics.

Following an informal meeting of national experts in 2014, it was determined that too little information was available on the current production levels of F4 flash bangers (which were considered as the most "problematic" kind of F4 article) in the EU; as a result, the Commission agreed to fund a study on this subject, which was carried out in 2016.[13]

The study observed that a multitude of web-shops were retailing F4 flash bangers, suggesting possible non-compliant trading practices. Indeed, the online acquisition and subsequent delivery by post of F4 flash bangers was identified as the main route to acquiring F4 flash bangers illegally in several EU Member States.[14]

During the subsequent discussions in the relevant expert groups (Expert Group on Pyrotechnic Articles and AdCo group on Pyrotechnic Articles), based on the information provided by the study on flash bangers, several Member States expressed the view that an additional study, covering this time all kind of F4 fireworks and focusing on the aspect of illegal sales of these articles, was necessary to better inform and organise the market surveillance activities, and evaluate if for instance an amendment to the Directive was required to address the problems identified.

In response to this request, the Commission agreed to sponsor this study that was conducted by Oxford Research A/S (Denmark) between September 2018 and April 2019.

1.4. Objectives

As indicated by the project specifications, the objectives of this study were to:

1. Provide a qualitative and where possible quantitative assessment of the problem of illegal sales of F4 fireworks in the EU;

2. Establish if and how sellers control that the purchaser is a person with specialist knowledge in his Member State of residence, with a view to identifying problems in verifying that a person has the necessary credentials;

3. Understand which elements and problems (be it a national or a European issue) can facilitate incidental or intentional diversion of F4 fireworks to members of the general public;

4. To understand if there are gaps or weak elements in the current legislation (and if there are, which ones) that could be solved at EU level by an amendment of the Directive or by other means;

[13] DJS Research (2016) F4 Flash Bangers in EU Member States: Study on production, import and use in the EU of high risk pyrotechnic articles categorised F4 according to Directive 2007/23/EC and Directive 2013/29/EU.

[14] Ibid.

1.5. Methodology

To address the study objectives, a research methodology was proposed for implementation managed by a team of European research consultants at Oxford Research A/S and EU pyrotechnics experts recognised as leaders in their respective fields.

To begin, an assessment of the online retail market for pyrotechnics was conducted across the EU Member States that profiled 310 company websites. The analysis determined whether it was possible to obtain F4 pyrotechnics online from these websites without the use of specialist knowledge controls. An extensive search and website testing procedure was followed, using pyrotechnics expert inputs to determine visually whether the pyrotechnics made available online corresponded to the F4 category (Chapter 2 contains more details on the methodology employed).

Further analyses were undertaken using an assessment of stakeholder consultation feedback and desk research to provide an:

- *Assessment of the illegal supply and use of F4 pyrotechnics* (Chapter 3): this analysis characterised the Member States according to their performance against a number of key variables, examined the main trends in the EU Member States identifying the countries where the non-compliant companies are based, and the countries where the articles are bought and used by non-authorised members of the general public, and assessed the negative impacts on national postal and EU-wide courier companies;

- *Assessment of the law and enforcement framework to address the non-compliant sale and use of F4 pyrotechnics* (Chapter 4): this analysis examined the performance of the Directive in addressing the problem under review, the extent of its successful implementation using cross-border and national enforcement methods, the comparative suitability of the national penalties set, and whether any obstacles exist that restrict the enforcement procedures such as a lack of resources etc.;

- *Assessment of the negative cost impacts caused by the illegal use of pyrotechnics* (Chapter 5): this assessment conceptualised the negative cost impacts according to a chain of events from the non-compliant sale, to the non-compliant transportation and finally to the non-authorised use of F4 pyrotechnics. These cost impacts are considered from a societal level perspective, considering the negative effects on the public sector, courier and postal companies, insurance companies, property owners, and of course those seriously or fatally injured etc.;

- *Multicriteria analysis of the policy options* (Chapter 6): against several criteria, a number of policy options were compared to explore how the existing Directive could be better enforced, and how the requirements of the Directive, harmonised standards and national legislation relating to penalties could be strengthened;

The type of evidence that fed into the above analyses included stakeholder responses to open and Likert scale questions, YouTube videos showing improper and irresponsible use of F4 pyrotechnics, Eurojust articles and other national newspaper articles on law enforcement activities, previous studies on the negative impacts caused by poor use of pyrotechnics, and Member State pyrotechnics accident data.

1.6. Consultation procedure and participants

A stakeholder consultation exercise was implemented to gather open question and Likert scale survey data from key organisations.

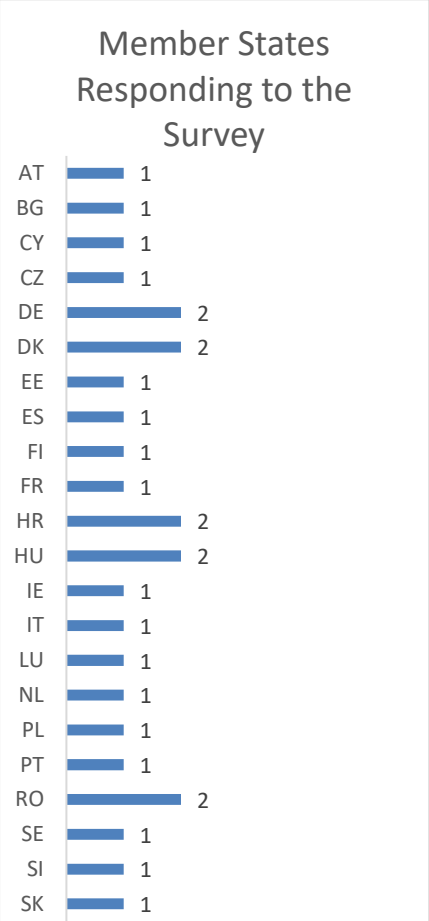
In total, 78 organisations were contacted, and 33 open question responses and 27 online survey responses were received from a mixture of market surveillance authorities,

competent authorities, law enforcement authorities, Notified Bodies, EU and national industry associations, postal and courier services companies.[15]

In some cases, the open question responses represented the views of more than one organisation considering that the questions covered the competencies of several organisations. Therefore, inputs were received from 38 organisations.

The participants to the online survey identified themselves as from the following countries, see Figure 1.1.[16]

Figure 1.1: Distribution of Member States: Online survey respondents



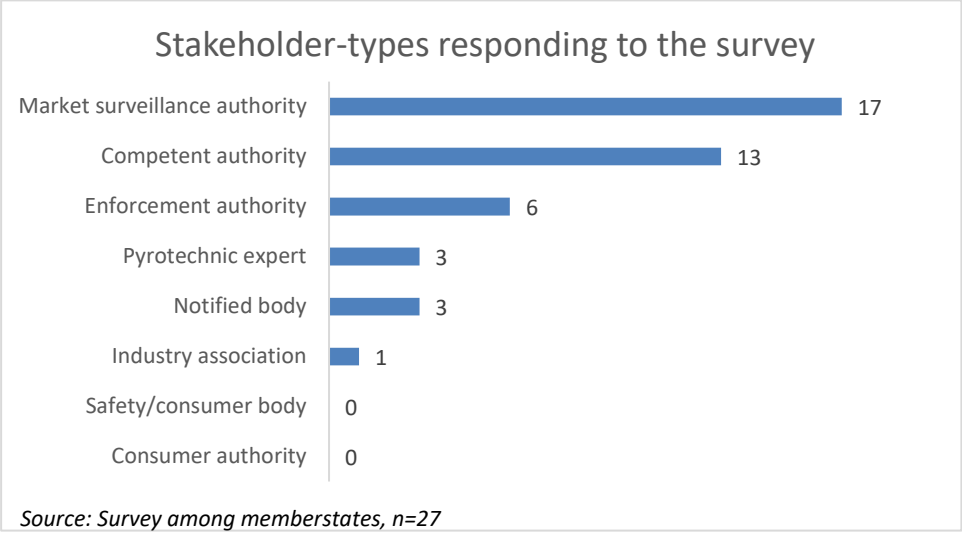
Source: Survey among memberstates, n=27

The organisations responding to the survey corresponded to the following stakeholder types, please see Figure 1.2. Please note that many of the stakeholders confirmed that they have several official roles and therefore were able to select several options to describe their stakeholder characteristics.

[15] Open question responses were not received from Belgium, Bulgaria, Greece, Malta, Slovenia

[16] Online survey responses were not received from: Belgium, Greece, Latvia, Lithuania, Malta and the United Kingdom

Figure 1.2: Distribution of stakeholder-type: Online survey respondents



Source: Survey among memberstates, n=27

It should be recognised that the response rate is not a detriment to the study because those participating only did so based on whether they had any useful information to provide.

Considering that the problems in the study scope pertain to activities in the black market, a higher response rate would unlikely add further value to the study as the issues examined were recognised as being hidden to many organisations, as explained further in Chapter 3.

2. ANALYSIS OF THE ONLINE METHODS FOR THE ILLEGAL SOURCING OF F4 PYROTECHNICS

2.1. Introduction

In this chapter, the analytical results of the online mapping activity of pyrotechnic web-shops are presented. The aim of activity was to determine whether online retailers based in the EU make available F4 pyrotechnics to the general public without any specialist knowledge controls, therefore demonstrating non-compliance with key requirements of the Directive 2013/29/EU.[17]

To explore this issue, a comprehensive search and analysis methodology was implemented guided by the following steps:

1. A pyrotechnics expert was charged with managing the online search and analysis process between November and December 2018;[18]
2. Four key search terms were defined and translated into the 24 main official languages of the EU Member States.[19] For each Member State, the national Google search engine was used (e.g. Google.dk) and the first four search results pages were checked for each search term;[20]
3. Where pyrotechnics retailers were identified, their websites were tested and checked to determine:
    - If F4 or "F4-like" pyrotechnics were promoted on the retailers' websites; [21] [22]
    - Whether it was possible to buy the F4 pyrotechnics online via ecommerce methods;

[17] See Article 7(3) of Directive 2013/29/EU.

[18] The websites reviewed may have changed subsequently and may / may not conform to the Directive. According to an expert interviewed, some companies offer F4s for sale online prior to the New Year's Eve celebrations and remove the articles afterwards or temporarily close the website altogether.

[19] The online search terms used were: "fireworks online sale", "professional pyrotechnics", "F4 pyrotechnics online sale", "specialist knowledge fireworks".

[20] The web-shop websites were Google translated to EN to support the analysis.

[21] Some products were categorised as "F4-like" where it was not possible to determine visually with a very high level of certainty whether they were F4 pyrotechnics. Given the potential safety risks to the public, we considered that these items should be retained for inclusion in the analysis.

[22] Products were classified as "F4-like" in instances where:

- Articles were referred to as "professional use" but there was no other supporting information on the classification of the articles and the size, shape and appearance of the type of F4 products (shells were automatically classified as F4s but old types of shells that used to be sold as consumer products were classified as "F4-like");
- The Net Explosive Content declared on the website suggested that the items reviewed had the same potential behaviour as an F4 (for example, the amount of flash composition).

- The extent of the F4 pyrotechnics product range corresponding to the 5 main F4 product categories as defined by the relevant harmonised standards i.e. "report", "flash bangers", "shells", "battery", "roman candle";[23] [24]
- If a specialist knowledge control was implemented by the retailer prior to purchase;
- The type of currency options made available to consumers;
- Whether the retailer sold products to its own national market (or cross-border only);
- The types of shipment services offered whether national or international;

4. The methodology followed a step-by-step filtering process, meaning that firms that were identified as not selling F4 pyrotechnics, or sold F4 pyrotechnics online but used specialist knowledge controls, were not subject to further analysis considering that it could be assumed that they do not supply professional pyrotechnics to the general public using e-commerce methods.

2.2. Online Mapping Results

In total, the mapping activity identified 310 pyrotechnics companies operating with a website that was identifiable within the search parameters.

Please note that the online mapping of companies in Poland occurred after a police investigation had taken place resulting in the closure of several web-shops (please see Chapter 4 for more details). When tested, these websites were no longer accessible and were not included in the analysis.

To begin, we examined if the online web-shops "displayed" F4 or "F4-like" pyrotechnics in some way, meaning that the retailers provided imagery or referenced F4 pyrotechnics online (this term should not be confused with "display services"). Therefore, companies identified as falling into this group contained those that sold F4 pyrotechnics online and/or in physical stores, offered display services using F4s pyrotechnics, or simply presented images of F4 pyrotechnics online without offering them for sale.

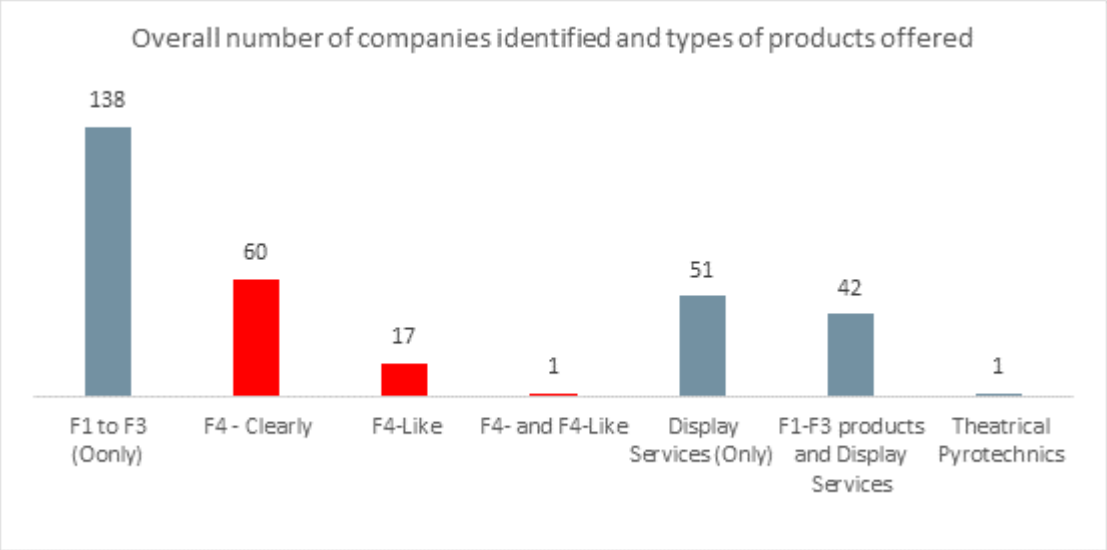
Most companies (232) were identified as not displaying F4 or "F4-like" pyrotechnics, and therefore were not subject to further analysis, please see Figure 2.1.

[23] The product category definitions can be found in EN-16261-1. These definitions can be summarised as follows:

- Report: pyrotechnic article designed to make a bang effect.
- Roman Candle: pyrotechnic article that uses a tube construction containing (propellent) charge, units and transmitting fuses.
- Shell: pyrotechnic article with(out) a lifting charge, designed to be projected and burst at a distance.
- Battery: pyrotechnic article consisting of an assembly of elements of the same or similar type related to one type of firework as indicated in the standard.
- Flash Banger: pyrotechnic article consisting of metal-based composition.

[24] The Report classification is a generic type within the harmonised standards for F4 fireworks that includes all Report effects including: flash bangers, ground maroons, maroons, report shells, etc. For F2-F3, this generic type does not exist but rather only "bangers" and "Flash Bangers". In terms of the analytical approach, when an article was not classified (or no information about classification was given online) it was difficult to include them within a specific subtype of "reports", and they were considered generally as reports. Only when flash bangers were clearly classified online as flash bangers where they considered as such, otherwise they were regarded as reports.

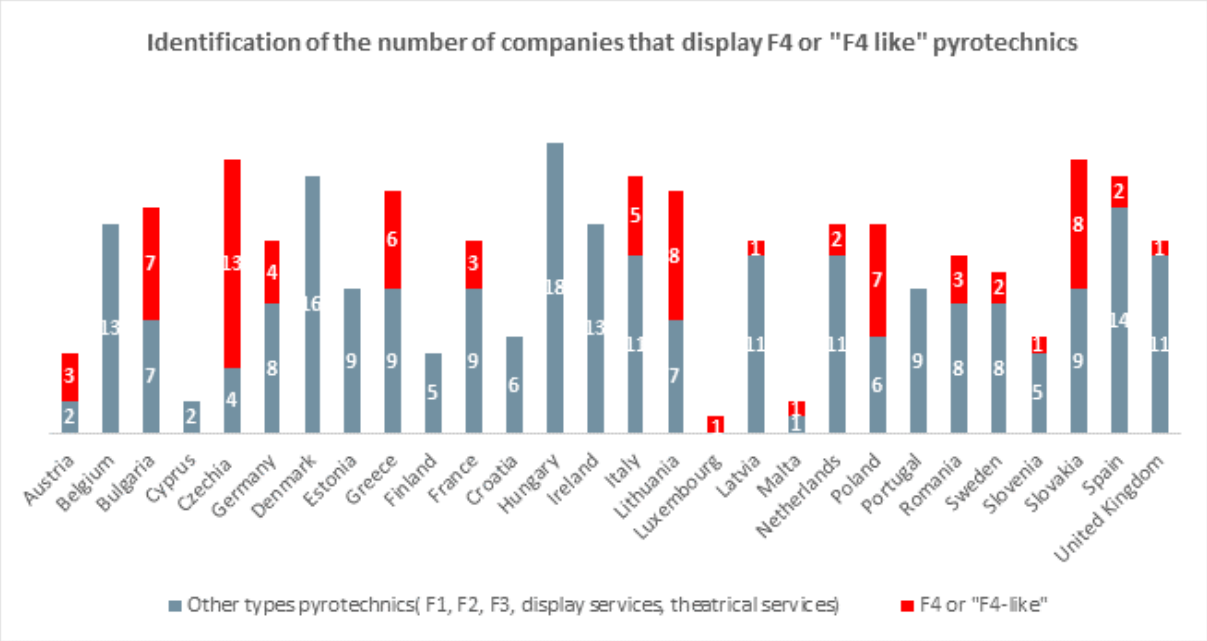
Figure 2.1: Identification of the number of companies that displayed F4 or "F4-like" pyrotechnics



Overall, 78 companies were identified as displaying F4 and/or "F4-like" pyrotechnics typically by providing option buttons to route consumers to their F4 catalogue and/or using imagery of F4 pyrotechnics; therefore, this group warranted further inspection to see if it was possible to buy the F4 pyrotechnics online and if specialist knowledge controls were implemented.

Please see Figure 2.2 to review the results by Member State from this first analytical step i.e. the companies that were identified as displaying F4 pyrotechnic products or not.

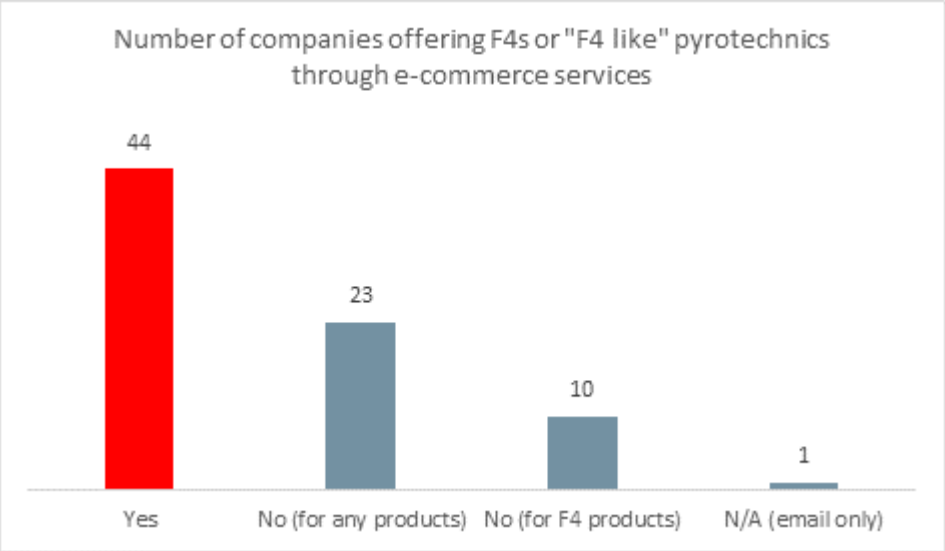
Figure 2.2: Identification of the number of companies identified as displaying F4 or "F4-like" products by Member State



Clearly, Figures 2.1 and 2.2 indicate that a large minority of pyrotechnic retailers based across the internal market were identified as displaying F4 and/or "F4-like" pyrotechnics, however, we have not drawn further attention to any specific countries here as a subsequent analytical step described below identified the companies that likely sell F4 pyrotechnics without specialist knowledge controls and makes reference to their country location.

The next step was to identify which of the 78 companies sell the F4 or "F4-like" pyrotechnics through e-commerce services, see Figure 2.3..

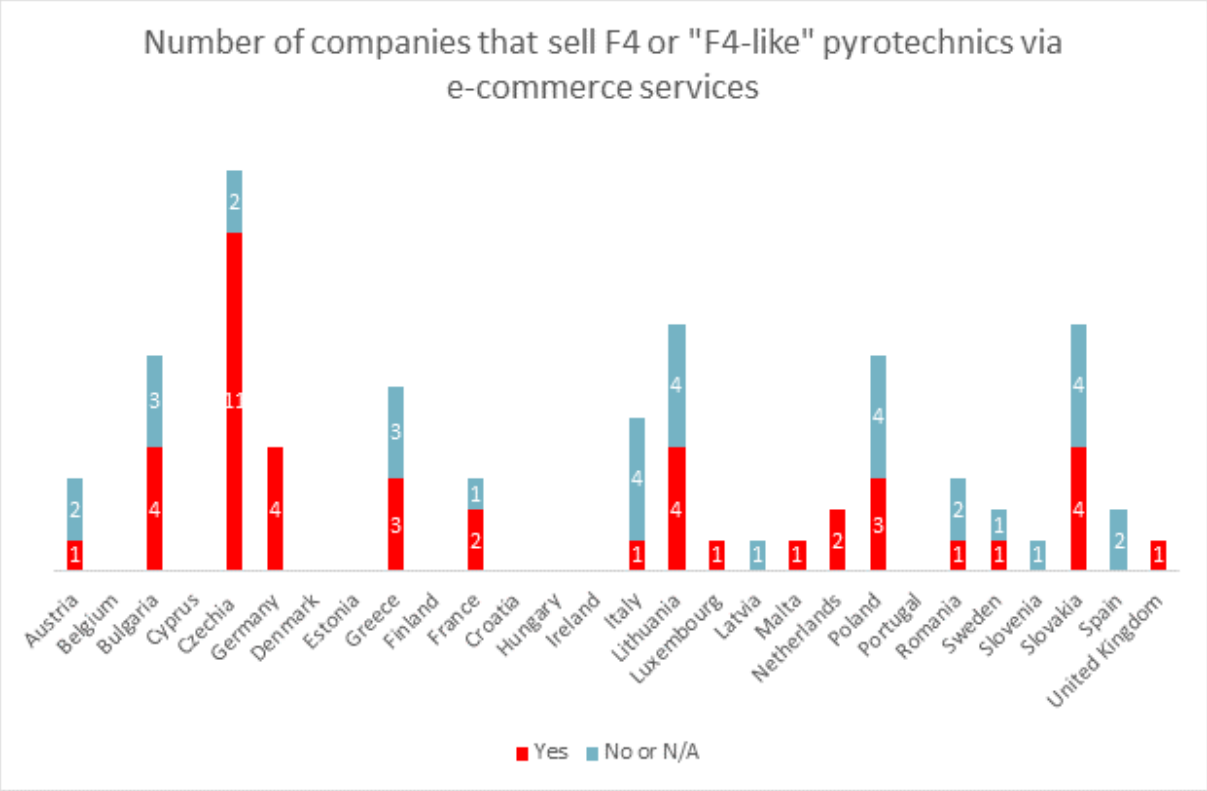
Figure 2.3: Identification of the number of companies identified as selling F4s and "F4-like" products through e-commerce services



As Figure 2.3 indicates, 44 companies were identified as selling the F4 pyrotechnics through e-commerce methods. The remaining cases either did not sell any types of fireworks online broadly speaking, did not sell F4 pyrotechnics online specifically even if they displayed them in some way, and in one case it was only possible to purchase the F4 pyrotechnics after submitting an email request; therefore, it was not possible to determine if this company used a specialist knowledge control or not and was excluded from further analysis.

Figure 2.4 indicates the number of companies that sell F4 of "F4-like" pyrotechnics by Member State.

Figure 2.4: Number of companies that sell F4 or "F4-like" pyrotechnics via e-commerce services by Member State



Again, we will not draw attention to any Member State here, although it does seem that there are several countries that are home to companies offering F4 pyrotechnics via e-commerce services.

The next step was to identify which of the companies offering F4 or "F4-like" pyrotechnics via e-commerce services performed specialist knowledge controls as part of their online customer journeys.

Figure 2.5: Number of companies that sell F4 or "F4-like" pyrotechnics via e-commerce services and perform specialist knowledge controls

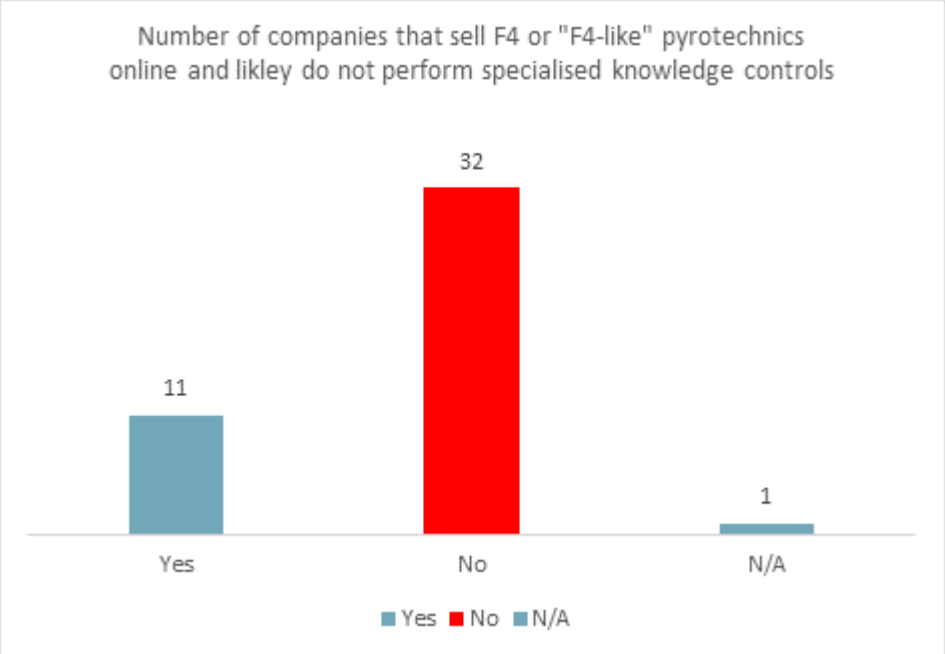
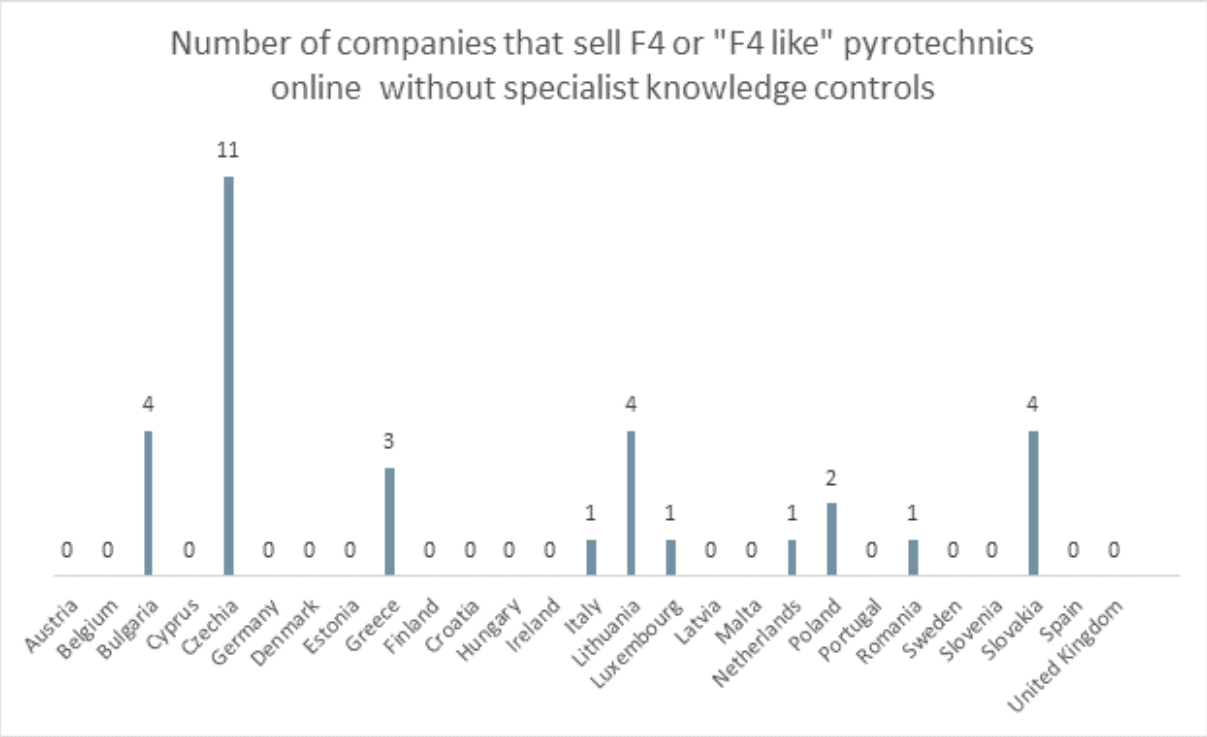


Figure 2.5 indicates that 32 companies, or about 73% of the 44 companies identified that sell F4 or "F4-like" pyrotechnics on the internal market, appeared not to implement any

specialist knowledge controls. These 32 companies are presented by Member State in Figure 2.6.

Figure 2.6: Number of companies that sell F4 or "F4-like" pyrotechnics via e-commerce services that likely do not use specialist knowledge controls by Member State



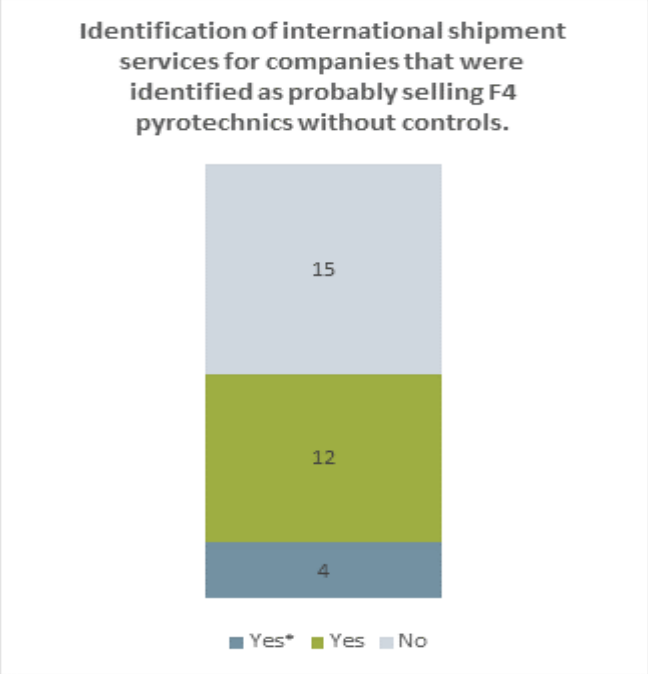
As illustrated, several companies were identified as selling F4 or "F4-like" pyrotechnics on the internal market without likely implementing specialist knowledge controls, where by number, Czechia was identified as the most prominent case with 11 companies identified. Bulgaria, Greece, Lithuania and Slovakia were identified with 3 or 4 companies not using controls, and Italy, Luxembourg, Netherlands, Poland and Romania were home to 1 or 2 companies falling into this category.

The next analytical step aimed to identify the extent to which the likely non-compliant companies had targeted their sales activities towards internal market. To examine this issue, two measures were tested:

- The number of companies that offer shipment outside their own country;
- The number of website language versions available for selection from a dropdown menu.

Figure 2.7 indicates the number of companies identified offering shipment outside of their own country.

Figure 2.7: Number of likely non-compliant companies identified offering shipment outside of their own country

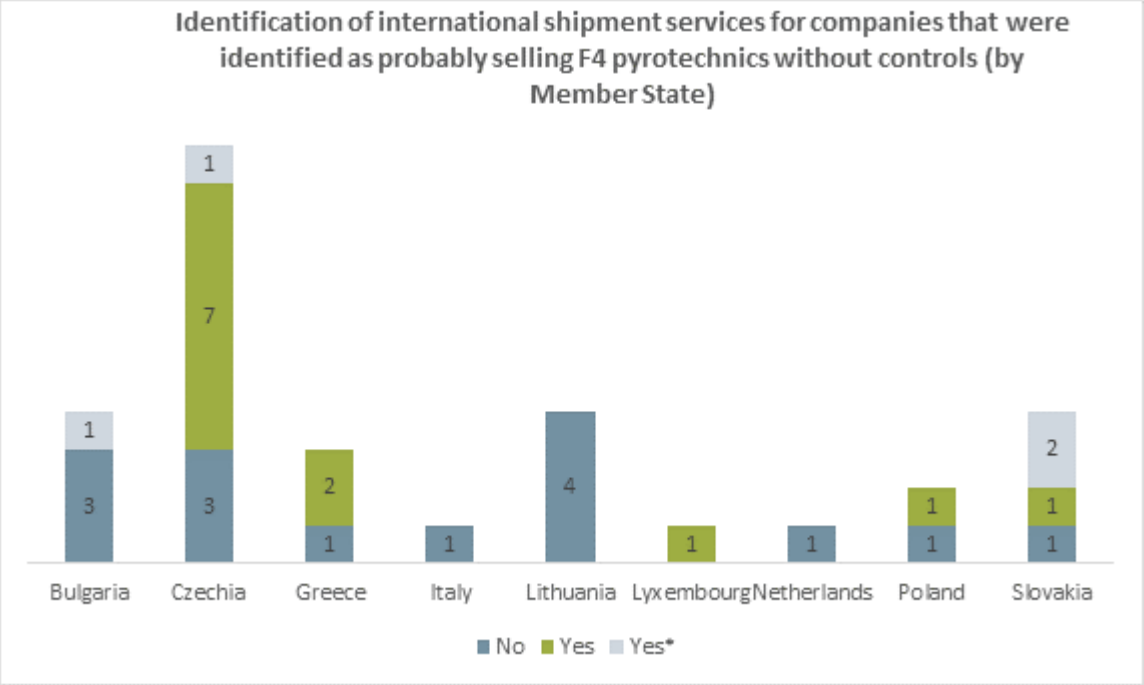


Please note: Yes* indicates courier services are restricted to a limited number of countries only.

The results indicated that half of the likely non-compliant companies were offering shipment outside of their country with 12 companies offering shipment across the EU, and 4 companies offering delivery services to a restricted number of countries.

Figure 2.8 indicates the number of the likely non-compliant companies identified offering shipment outside their own country by Member State.

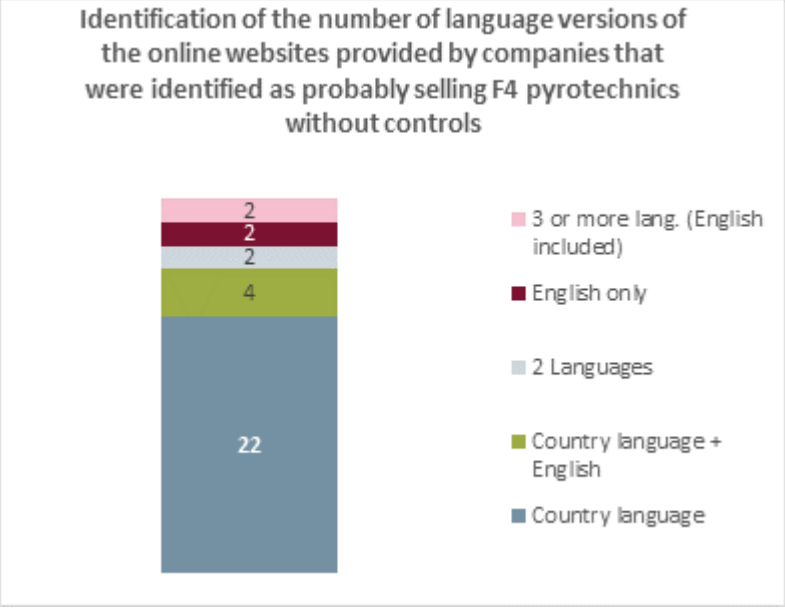
Figure 2.8: Number of likely non-compliant companies identified offering shipment outside their own country by Member State



As the results show, Bulgaria, Czechia, Greece, Luxembourg, Poland and Slovakia were identified as being home to companies that had made efforts to ease the supply of F4 pyrotechnics to users cross-border.

Figure 2.9 indicates the number of websites available in more than one main national language.

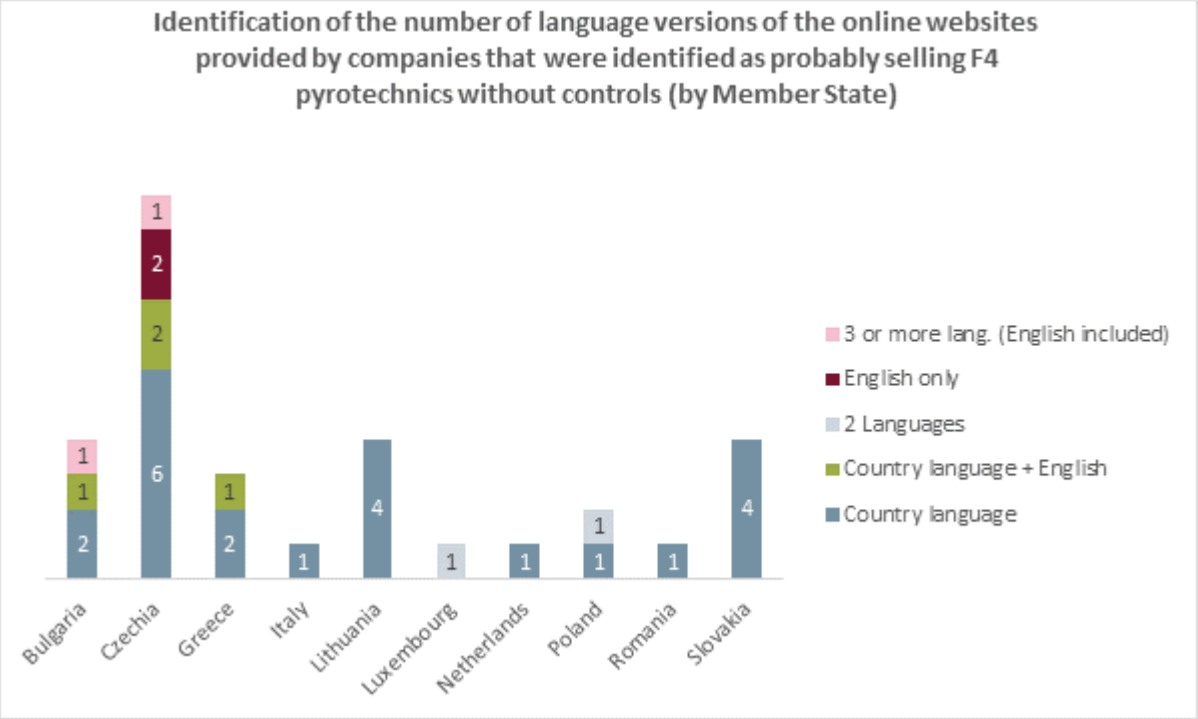
Figure 2.9: Number of likely non-compliant company' websites available in more than one main national language



In total, 10 company websites were available in more than one language, again suggesting that efforts have been made by the likely non-compliant companies to sell the products to other Member States.

Figure 2.10 indicates the number of websites available in more than one national language by Member State.

Figure 2.10: Number of likely non-compliant websites available in more than one main national language by Member State



The results indicated that Bulgaria, Czechia, Greece and Poland were identified as being home to companies that had made efforts to ease the readability of their websites to consumers outside of their home country. The company based in Luxembourg also had a website available in two languages but of course this is likely due to the multilingual make-up of this country.

2.3. Product range analysis

To provide an indication of the level of risk associated with each of these companies, we analysed the extent of the range of products offered under each of the 5 main F4 and "F4-like" pyrotechnic group categories i.e. report, shells, flash bangers, battery, roman candle.

We assumed that the larger the product range marketed by the companies, the higher the risk for a larger volume of products to be sold on the internal market. We categorised the extent of the product ranges offered into three types:

- Less than 5 product types marketed (in light blue);
- 5 to less than 25 product types marketed (in medium blue):
- More than 25 product types marketed (in dark blue).

The heat map analysis illustrated by Figure 2.11 indicates the different type of main product groups on the x-axis and the location of the companies on the y-axis.

Figure 2.11: Heatmap analysis of the product range of firms that does not seem to use controls

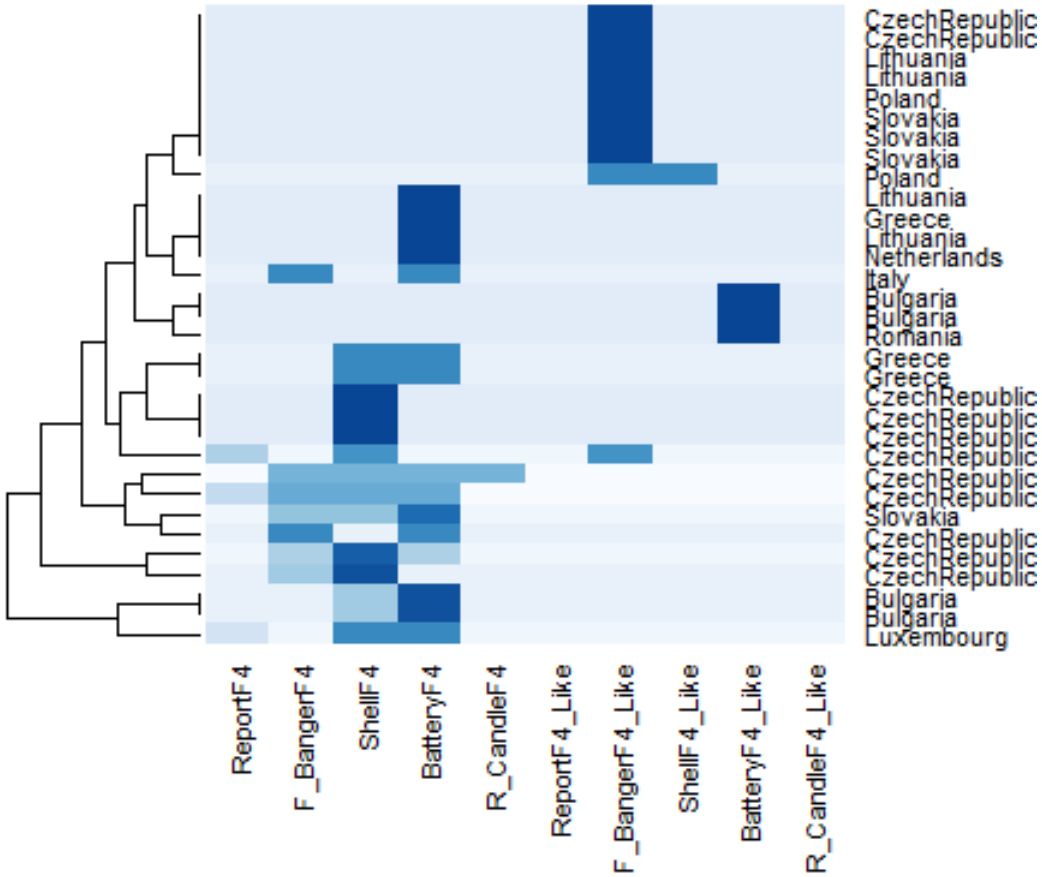


Figure 2.11 indicates that most of the likely non-compliant companies were identified by the pyrotechnics expert as marketing F4 products (see the left hand side of the diagram) rather than "F4-like" products (right hand side); this second group were difficult to confirm with a very high level of certainty that they marketed F4 products although we considered that they merited analysis given the potential safety risks to the public.

In the left-hand bottom corner of Figure 2.11 there is a concentration of firms selling a comparatively greater range of F4 pyrotechnics associated with several key product groups, mainly F4 flash bangers, shells and batteries and to a lesser extent reports and roman candles. In some cases, the ranges are extensive as indicated by the dark blue cells, meaning that 25 or more product types are marketed online corresponding to the relevant product group. The firms in this group were identified in Czechia mainly, but also Bulgaria, Greece, Luxembourg, and Slovakia.

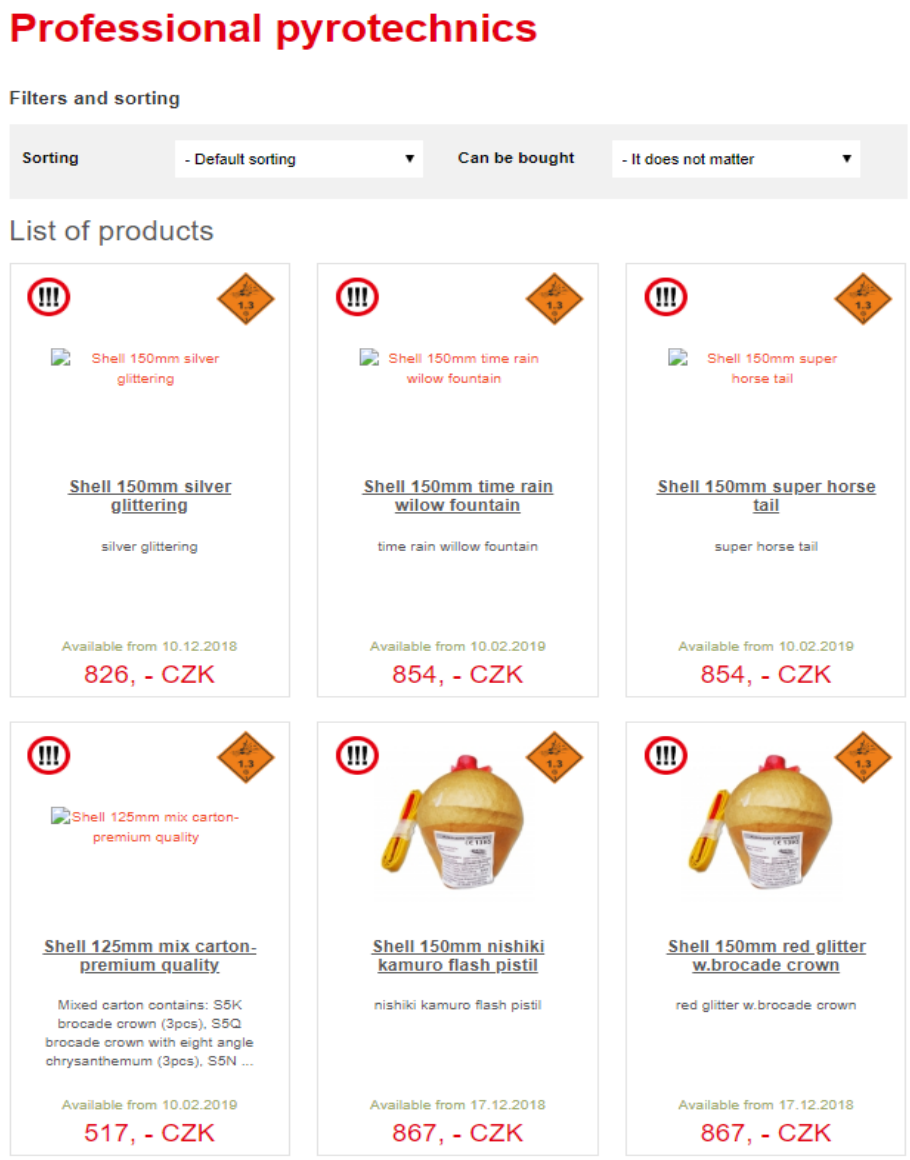
In the upper part of the left-hand side of Figure 2.11, there is one Italian firm that markets between 5 to 25 products under the F4 categories of flash bangers and batteries, and firms in Lithuania and the Netherlands that market more than 25 product types under the category of F4 batteries.

On the right-hand side of Figure 2.11 the firms were identified as marketing "F4-like" products, including flash bangers, batteries and shells; this included companies in Czechia and Slovakia mainly, but also Bulgaria, Lithuania, Poland and Romania.

2.4. Illustrative examples of companies that do and do not use specialist knowledge controls

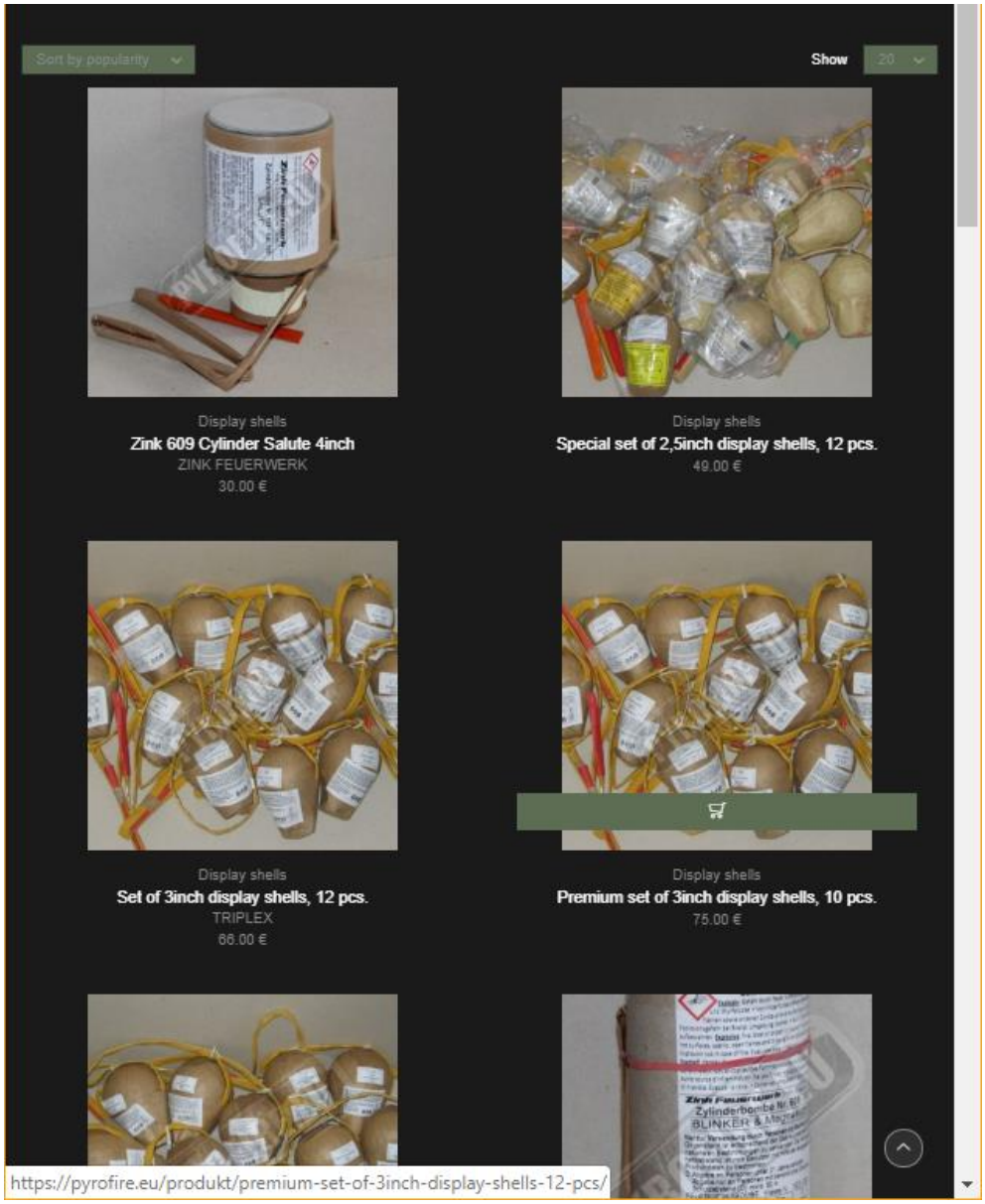
As part of the online mapping activity, screen shots were taken to provide some illustrative examples of the types of products offered by companies that do not appear to use specialist knowledge controls. Examples are indicated in Figure 2.12., 2.13 and 2.14.

Figure 2.12: Examples of F4 pyrotechnics sold by retailers that do not seem to use controls[25]



[25] Available at www.klasektrading.cz Accessed on 03/12/2018

Figure 2.13: Examples of F4 pyrotechnics sold by retailers that do not seem to use controls[26]



[26] Available at: www.profire.eu Accessed on 03/12/2018

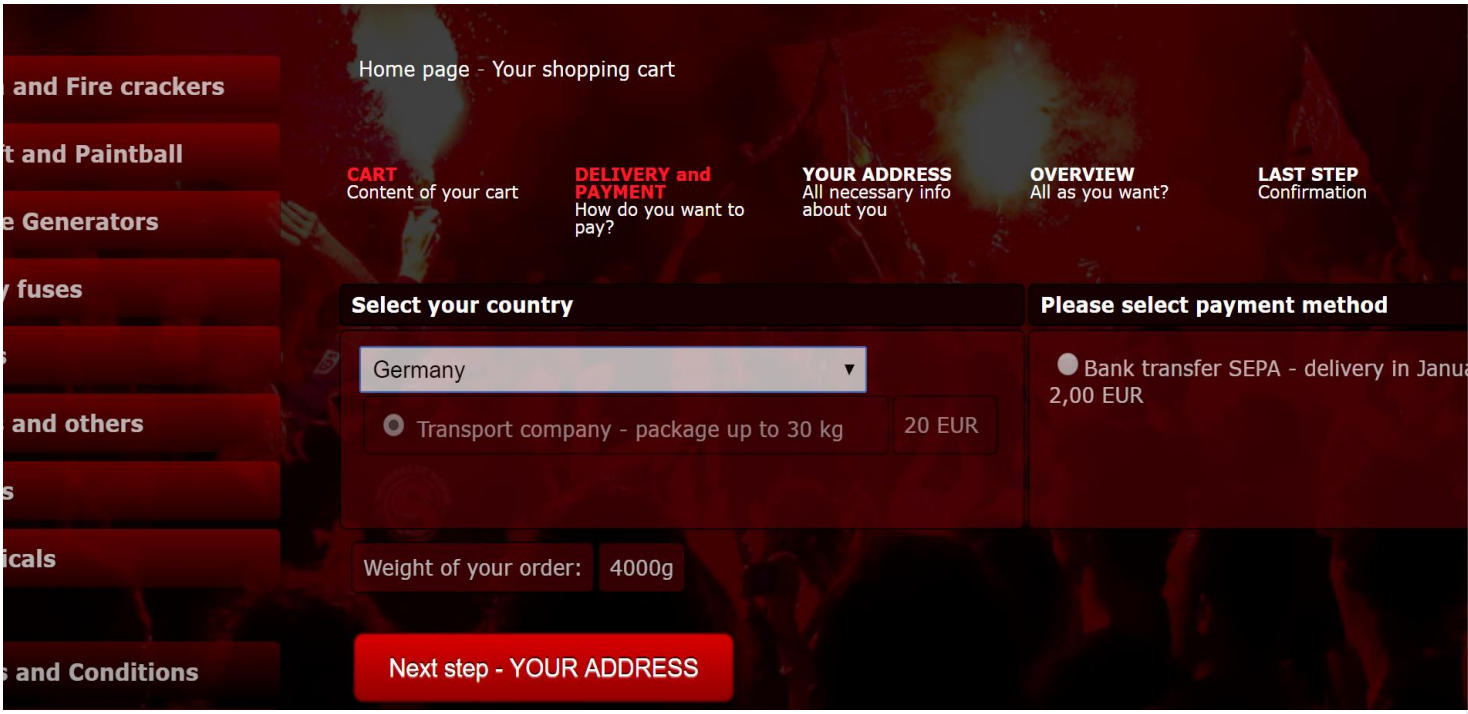
Figure 2.14: Examples of F4 pyrotechnics sold by retailers that do not seem to use controls[27]

The screenshots in Figures 2.12, 2.13 and 2.14 indicate that the products can be selected for purchase. As tested by the pyrotechnics expert, as is typical of these websites that do not seem to use controls, the customers are routed to a subsequent page where payment information is requested.

An example of another company website that does not appear to use specialist knowledge controls is indicated in Figure 2.15.

[27] Available at: www.pyro-airsoft.cz Accessed on 03/12/2018

Figure 2.15: Examples of F4 pyrotechnics sold by retailers that do not seem to use controls[28]



As can be seen in Figure 2.15 the transportation costs must be paid, but there is no indication that a certified courier that complies with the legal requirements of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) to transport pyrotechnic articles will be used (even if this is not necessarily an indication that an unauthorised carrier will be used, feedback from an ADR certified courier suggested that the low transportation cost i.e. 20 EUR, suggested that the courier firm offering this service would likely not be ADR certified).

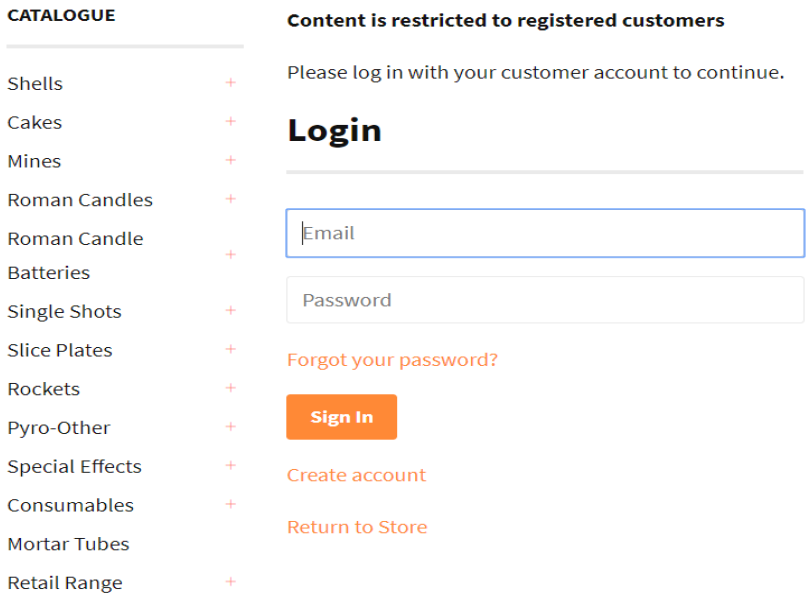
Another page routes the customers to the delivery and payment options page without any further checks. This routing procedure is typical of the websites reviewed that likely do not use controls.

Moreover, it was detected that some of the websites that likely do not use controls provided disclaimers suggesting that the purchase or use of F4 pyrotechnics may be subject to controls in the Member States where the (non-authorised) users were based. Clearly, this is a non-compliant of method of ensuring that only persons with specialist knowledge handle and use F4 pyrotechnics.

Where specialist knowledge controls were used by the 11 retailers identified, the companies often required prior registration or email exchange checks to enable the customer to purchase the F4 pyrotechnics online. Sometimes restrictions were used to access the professional fireworks part of the website, as indicated in Figure 2.16.

[28] Available at: www.pyrogate.eu Accessed on 03/12/2018

Figure 2.16: Example of a restricted website managed that uses specialist knowledge controls[29]



2.5. Key conclusions and recommendations

Conclusions

- Overall, the results suggested that the online pyrotechnic retail market is largely compliant with its legal responsibility of not making available F4 pyrotechnics to the general public through online means. This finding extends to 90% of the 310 company websites reviewed;

- However, based on the sample reviewed, it seemed that about 73% of companies that supply F4 pyrotechnics online do so without implementing specialist knowledge controls. In total, this share represented 32 companies;

- The analysis revealed that 16 non-compliant traders had adapted their sales strategies to target consumers across the internal market through international shipping services; whereas 10 provided several language versions of their websites. Therefore, this illegal business activity should be considered as both an EU and national issue to be addressed;

- The heat map analysis indicated that many of these non-compliant companies marketed extensive product ranges, suggesting that they sell extensive product volumes to cater for a range of unauthorised user preferences;

- Pyrotechnic expert feedback suggested that some non-compliant traders make professional fireworks available to the public in the run-up to the New Year's Eve celebrations only;

[29]Available at http://www.kimboltonfireworks.co.uk/ Accessed on 03/12/2018

- Considering the outcome of the mapping exercise, it seemed that there are enforcement and compliance gaps in some Member States relating to the requirements of Article 7(3); [30]

Recommendations

- Considering the need to ensure a level playing field on the internal market, to protect compliant companies from unfair competition and the general public from safety risks, it is recommended that investigative actions managed by the relevant European and national authorities are initiated nationally and across the EU to tackle the non-compliant traders identified;

- Moreover, given the need to address both the supply and demand aspects of the problem, it is recommended that unauthorised customers who buy restricted F4 articles, including those customers based in Member States other than where the web-shops are located, are profiled and investigated, implying that cross-border cooperation is needed between the relevant authorities to share information and other relevant resources;

- To strengthen the enforcement of the requirements set by Article 7(3)[31], we suggest that the Commission and all authorities involved consider the results of the Policy Options analysis so that the suggested policy initiatives can be instigated to address the problem.

[30] Article 7(3): Manufacturers, importers and distributors shall not make available on the market the following pyrotechnic articles except to persons with specialist knowledge: (a) fireworks of category F4;
[31] Ibid

3. ASSESSMENT OF THE ILLEGAL SUPPLY AND USE OF F4 PYROTECHNICS

This Chapter provides an overview of some of the key dynamics and trends around the non-compliant supply and use of F4 pyrotechnics in the EU.

3.1. Investigative results of a recent cross-border enforcement action

To obtain a quick insight into the scale of the problem of the illicit sale of F4 pyrotechnics on the internal market, it is helpful to highlight the results of a recent cross-border enforcement action that took place November to December 2018.

As described on the Eurojust press release page, the authorities in Poland recently closed down 4 web-shops selling F4 pyrotechnics illegally, and in the process arrested 35 persons associated with an Organised Crime Group (OCG) and searched 150 properties and businesses.[32]

In a warehouse managed by one of the web-shops, 80 tonnes of F4 pyrotechnics were seized, enough to fill four large shipping containers. After assessment of the evidence, it was estimated that the OCG shipped 1000 kg of F1 to F3, and 500 kg of F4 pyrotechnics to different Member States per day.

This initiative was launched initially by the Dutch authorities in response to the problem of members of the general public in the Netherlands purchasing F4 pyrotechnics illegally online from Poland. In preparation for the investigation, several European Investigation Orders were exchanged between Poland, Germany, the Netherlands and France requesting searches of premises and seizures.

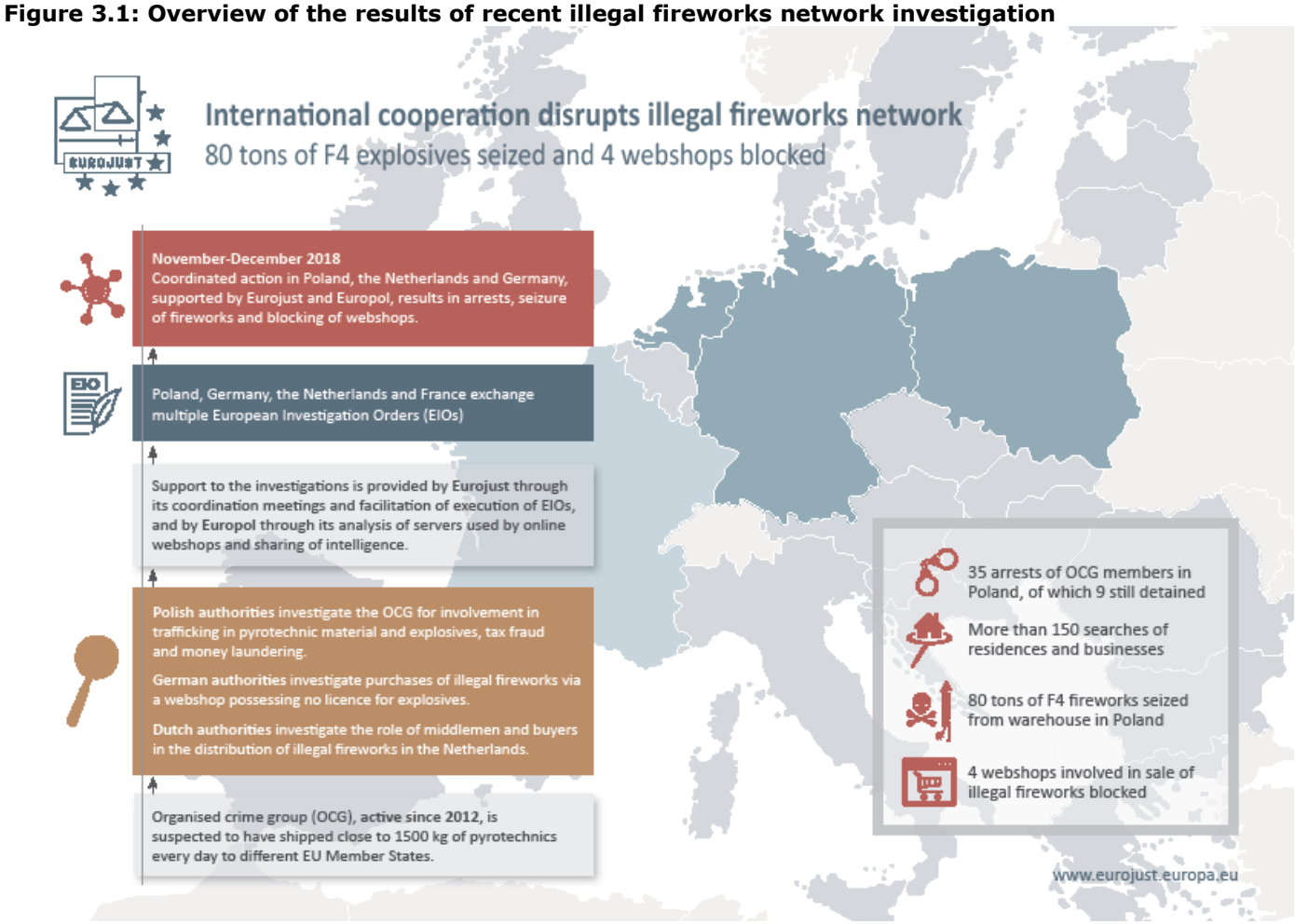
To support efforts, Eurojust enhanced cooperation between the relevant parties to identify and flesh-out the common goals and objectives. This was complemented by the activities of Europol that performed intelligence and information sharing.

As part of this effort, in Germany, 50 households were searched resulting in 315 kg of F2 to F4 pyrotechnics being seized, moreover, 74 postal shipments containing F4 pyrotechnics with a gross weight of 400 kg were detected with the support of the courier services.

It could be the case that not all the F4 pyrotechnics associated with this case were purchased by the general public. A pyrotechnics expert assumed that a proportion of the F4 pyrotechnics sold online without specialist knowledge controls would be bought by professional pyrotechnic experts based in other Member States. Figure 3.1. provides an overview of some of the key results of this recent investigation.

[32] Eurojust (2018): "International cooperation disrupts illegal fireworks network". Available at: http://www.eurojust.europa.eu/press/PressReleases/Pages/2018/2018-12-06.aspx

Figure 3.1: Overview of the results of recent illegal fireworks network investigation



Source: Eurojust

3.2. Overview of the problem of the non-compliant sale of F4 pyrotechnics

Introduction to the type of feedback received from national respondents

While the recent case described above provides a helpful snapshot into some of the illicit activities of organised criminals, this study aimed to further characterise the problem of the illegal sale of F4 pyrotechnics to the general public.

In addition to the online mapping activity (see Chapter 2), the study also gathered information on the illegal sale of F4 pyrotechnics from national bodies charged with competent authority, market surveillance or notified body roles as defined under the Directive, and to a lesser extent police and explosive authorities, business associations and courier and postal service companies. This information has been processed and analysed to provide an overview narrative of the trends observed by these key bodies.

Before highlighting the key points made, it should be highlighted that some national authorities confirmed that they have not been alerted previously to the problems in the study scope, or believe they occur on a minor scale; therefore, overall the results of the interviews suggested that the intensity of trends vary quite widely or have been reported to the authorities to different extents across Europe.

At the same time, it should be acknowledged that as the problem in the study scope operates in the context of the "(online) black market", it has been difficult for some Member State authorities to provide concrete information on the key dynamics and the scale of the trends. Therefore, in some cases, while authorities provided limited evidence, it was acknowledged the problem of the illegal sale of F4 pyrotechnics is hidden from the

authorities considering that a large part of the illegal transactions were noted as occurring online with shipments taking place using unmarked parcels.

For example, interview or written feedback from authorities in Austria, Cyprus, Czechia, Denmark, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Luxembourg, Lithuania, Latvia, Netherlands, Poland, Portugal, Sweden and the United Kingdom indicated that they are aware of the possibilities to purchase F4 pyrotechnics illicitly.

In these Member States, negative instances around the misuse of the F4s were acknowledged, for example, as result of police or customs investigations, but the level of reported cases ranged from a very small to a relatively large number per country. [33]

As an observation, the authorities in Denmark, Italy, Netherlands, and Sweden, and a Danish industry association, had comparatively more insight into the issue on the ground given the extensive enforcement activities in these countries, but also there was stronger recognition of national subcultures around the misuse of F4 pyrotechnics.

However, in Ireland, Slovakia and Portugal problems with the misuse of F4s have not been reported although the authorities were open to the idea that a small number of undetected private individuals may have purchased the F4 pyrotechnics online although in some cases this was considered unlikely.

Whereas for Croatia, Hungary, Romania and Spain, there was no official knowledge of the (online) black market and it was mentioned that the misuse of F4s was not something that had been reported to the authorities.

Identification of the main drivers facilitating diversion of F4 pyrotechnics to the general public

The feedback received suggested that the illicit sale of F4 pyrotechnics originates from several key sources:

1. the main source by sales volume relates to the online sale of fireworks originally imported from China and sold across the internal market illegally in undermarked parcels;
2. to a lesser degree there is the EU-wide transportation of fireworks by Organised Crime Groups (OCGs) from one Member State to another;
3. there is the direct or indirect sale of F4 flash bangers manufactured by licensed Italian producer(s) to OCGs;
4. in some countries, there is the problem of the intermittent illegal production and sale of F4 pyrotechnics by unlicensed criminal producers;
5. small scale intermediaries also form part of the supply chain, buying F4 pyrotechnics online or from OCGs and selling them periodically in small volumes on social media or by word of mouth directly to users.

Given the key drivers described above, the problem can be viewed as a European one, involving importers, producers, retailers and users, as explained in more detail below:

Illicit online sale of F4 pyrotechnics

The most frequently reported problem, and the most significant problem by volume and revenue, is the illicit online selling of F4 pyrotechnics without specialist knowledge controls

[33] In the UK, the use of F4s purchased from web-shops that did not use controls was believed to be on a small scale and not considered as causing a public nuisance when the F4s were used.

to the general public, conducted by web-shops based in the EU with the sales activities taking place across the internal market.[34] [35]

Respondents mainly identified the location of the web-shops as Czechia and Poland. The assumption is that the web-shops source their F4s pyrotechnics from importers of Chinese fireworks mainly including roman candles, batteries, display shells and flash bangers, and to a lesser extent from Italian producer(s) concerning certain types of flash bangers.

It was assumed that the European importers of Chinese fireworks and some European producers sell their fireworks to the non-compliant traders legally, that is, in line with the necessary transportation rules; the International Maritime Dangerous Goods (IMDG) Code and the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). However, when engaging in commercial transactions with the importers, it was suggested that in some cases the web-shops provide false documentation concerning their specialist knowledge credentials to handle F4 pyrotechnics and national licenses to store fireworks, as was the case with the OCG in Poland that was subject to the recent investigation described above.

Further legal discrepancies occur as part of the commercial transactions between the web-shops and the general public. Only persons with specialist knowledge can handle and use F4 pyrotechnics, however, appropriate controls are not performed by the non-compliant web-shops as part of the online customer journey; therefore, the non-compliant traders break the law intentionally to make a profit.

Following this, the F4 pyrotechnics are distributed by the web-shops to the consumers across the EU by means that are non-compliant with the ADR; namely by using non-certified courier services and un-labelled packages. Moreover, the customers themselves break the law by acquiring F4 pyrotechnics without specialist knowledge and by storing the products without a national storage licence.

As an example of the volume of products that are being seized, in Sweden, from November to December 2017, 200,000 pyrotechnic articles were seized, 20% of which were in the F4 Category many of which were flash bangers. These items, all of which are banned for personal use by the general public in Sweden, were purchased from non-compliant web-shops based in other Member States.

(EU-wide) sale and transportation of F4 pyrotechnics by Organised Crime Groups (OCGs)

Respondents mentioned that there is a problem of Organised Crime Groups (OCGs) that do not have the required specialist knowledge physically transporting F4 pyrotechnics to the Netherlands, Belgium and Germany.[36] These OCGs likely source their products from Czechia, Italy and Poland, and store the F4 pyrotechnics in warehouses in Germany and previously also in Belgium to ease distribution; the items are then transported to the Netherlands for sale to unauthorised users.

The Dutch authority pointed out that in 2018 there was a police investigation into an Organised Crime Group (OCG) resulting in the confiscation of 12 tonnes of illegally stored F4 pyrotechnics in the Netherlands, including dangerous types of F4s such as reports,

[34] The identification of this problem is supported by the results of the mapping activity, that identified that 73% of retailers that sell F4 pyrotechnics online do so without the necessary checks of professional licences, see Chapter 2.

[35] The French authorities indicated that they had tested previously a very small sample of online web-shops and indicated that some of them did not implemented the necessary controls.

[36] The Dutch respondent confirmed that there had been cooperation between the Dutch and German authorities to address the issue of the Organised Crime Groups (OCGs).

batteries, shells and flash-bangers. Similarly, in 2016, there was a criminal case involving a Dutch OCG that had transported around 20 to 30 containers of F4 pyrotechnics to the Netherlands illegally from other Member States and had operated an illegal storage containing 35 tonnes of F4 pyrotechnics located in Germany.

In Italy, seizures to prevent the illegal transportation and storage of F4 pyrotechnics have been conducted on several occasions by the authorities. The authority noted that on New Year's Eve 2018 the police forces seized 5000kg of CE marked F4 pyrotechnics from the general public. As reported by the Italian press, there have been several previous cases where large quantities of (F4) fireworks stored illegally have been seized. [37] [38] [39] [40] [41] [42]

In Czechia, unlicensed market stall salespersons that apparently have links to OCGs are known to make available F4 pyrotechnics on a significant scale to the general public.

Indirect or direct sale of F4 flash bangers to OCGs manufactured by an Italian producer(s)

Respondents mentioned that F4 flash bangers made in Italy are being sold illegally to OCGs and non-compliant web-shops. One respondent pointed out that the F4 flash bangers can be traced mainly to one producer in particular, although other feedback was not as specific as this.

Some respondents considered that the sale of the Italian flash bangers could be made legally to the web-shops and supposed intermediaries that may then sell-on the F4 pyrotechnics to OCGs. However, one respondent mentioned that the sale may be completed directly with the OCGs.

As a result of the ongoing testing of the chemical composition of flash bangers that are confiscated by the Dutch authorities, it was suggested that the F4 flash bangers produced in Italy are much more widespread on the black market than those produced in China.

Remarkably, another respondent mentioned that it is well understood in official circles that the level of production of Italian F4 flash bangers is much greater than the amount used by EU pyrotechnics professionals.[43]

An Italian respondent also noted that through their enforcement activities they have detected that the illicit sale of F4 pyrotechnics can be linked to licensed businesses that are also involved in the legal manufacture distribution and sale of F4 pyrotechnics.

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[37] RomaToday (2018): "Un deposito con oltre 60 chili di botti di Capodanno fra le abitazioni, sequestrati". Available at: http://www.romatoday.it/cronaca/sequestro-botti-capodanno-albano-laziale.html

[38] Questura di Torino (2018): "Torino: sequestrati 400 kg di artifizi pirotecnici illegali destinati ai festeggiamenti di capodanno".
Available at: https://questure.poliziadistato.it/it/Torino/articolo/6905c28c540c7789712685614

[39] Questura di Torino (2018): "Torino: sequestrati 700 kg di materiali esplodenti illegali".
Available at: https://questure.poliziadistato.it/it/Torino/articolo/6905c2a038dc9f98577958200

[40] Sistema Informativo Anticontraffazione (2017): "Sequestrati quasi 700 kg di fuochi pirotecnici".
Available at: https://siac.gdf.it/notizie/Pagine/Sequestrati-quasi-700-kg-di-fuochi-pirotecnici.aspx

[41] Ottopagine.it (2018): "Mortai e 400 chilogrammi di fuochi sequestrati".
Available at: https://www.ottopagine.it/bn/cronaca/146194/mortai-e-400-chilogrammi-di-fuochi-sequestrati.shtml

[42] Gir Grottaglieinrete (2017): "Taranto, maxi sequestro di fuochi d'artificio. 2mila400 pezzi per 120 kg. Distrutti dagli artificieri".
Available at: https://www.grottaglieinrete.it/it/taranto-maxi-sequestro-fuochi-dartificio-2mila400-pezzi-120-kg-distrutti-dagli-artificieri/

[43] The source of this finding was a previous EU funded study: DJS Research (2016) F4 Flash Bangers in EU Member States: Study on production, import and use in the EU of high-risk pyrotechnic articles categorised F4 according to Directive 2007/23/EC and Directive 2013/29/EU.

Intermittent national illegal production of F4 pyrotechnics by criminals

The intermittent national illegal production of F4 pyrotechnics by unlicensed criminals provides another route for these products to reach the black market.

In this case, the fireworks are produced on an *ad hoc* basis without any third party or factory controls and distributed informally by OCGs.

In Austria, in 2014, an illegal factory that produced flash bangers that had qualities similar to professional fireworks for the Austrian and Czech black markets was closed down by the authorities; over a two-year period, the factory produced 30,000 flash bangers using 4 tonnes of chemical substances.

A Danish association mentioned that there was a successful investigation in 2016 into an illicit factory in Denmark managed by an OCG producing "F4" flash bangers that were several times more powerful than those used by the military; in this case, 200,000 "F4" pyrotechnics were seized.[44] The association mentioned that the identification of illegal factories by the authorities had occurred on previous occasions in the run up to the New Year. Examples of previous cases in Denmark are provided in the footnote.[45] [46]

Moreover, the illegal production of pyrotechnics prior to the New Year's Eve celebrations has been detected through enforcement actions in Italy (as illustrated by the newspaper articles indicated in the footnotes on the previous page).

Small scale national intermediaries and private persons

A final route to the market involves small scale intermediaries selling the F4 pyrotechnics directly to the public via social media and word of mouth.

In Denmark, it was suggested that this is the main sales channel to the public. In this case, the intermediaries purchase the F4 pyrotechnics from the web-shops and sell the products on to the public. For example, in 2018, the police seized over 5000 illegal fireworks from two addresses, and in 2017, 1000 illegal fireworks and cash were seized from another criminal.[47] [48]

In the Netherlands, it has been known for private persons to drive to Belgium to purchase F3 pyrotechnics[49], and Czechia and Poland to buy F4 pyrotechnics for personal use. In Denmark and Germany, where some F3 pyrotechnics are illegal for personal use, Danish consumers have been known to buy bangers in Germany that are banned in Denmark, and German consumers have been known to buy large rockets and combinations in Denmark that are banned in Germany. As indicated in the article below on Czechia, German

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[44] Viborg Folkeblad (2015): "Politiet fandt 1000 bomber og fem ton fyrværkeri ved Jels".
Available at: https://viborg-folkeblad.dk/krimi/Politiet-fandt-1000-bomber-og-fem-ton-fyrvaerkeri-ved-Jels/artikel/1687

[45] JydskeVestkysten (2012): "Dræbte fra Andst-katastrofen er knyttet til firma, der vil opføre fyrværkerilager"
Available at: https://www.jv.dk/esbjerg/Draebte-fra-Andst-katastrofen-er-knyttet-til-firma-der-vil-opfoere-fyrvaerkerilager/artikel/1358271

[46] BT (2006): "To brødre dræbt af fyrværkeri".
Available at: https://www.bt.dk/krimi/to-broedre-draebt-af-fyrvaerkeri

[47] Sjællandske Medier (2017): " 28-årig anholdt: Lå inde med 1100 kraftige kanonslag".
Available at: https://sn.dk/Vestegnen/28-aarig-anholdt-Laa-inde-med-1100-kraftige-kanonslag/artikel/711760

[48] Danmarks Radio (2018): "Årets fyrværkerihøst: 5.398 kanonslag og 0 chrysantemumbomber".
Available at: https://www.dr.dk/nyheder/regionale/trekanten/aarets-fyrvaerkerihoest-5398-kanonslag-og-0-chrysantemumbomber

[49] Please see the YouTube video on cross-border pyrotechnics shopping from NL to BE: https://www.youtube.com/watch?v=-jTnMt-fvDU

consumers are known to purchase F2 and F3 pyrotechnics in Czechia given the comparatively relaxed laws, and it was also noted that illegal fireworks that do not carry the CE mark are available on "Asian markets".[50] Similarly, persons have been known to drive from the Republic of Ireland to Northern Ireland (UK) to purchase F2 and F3 fireworks which are banned for personal use in the Republic of Ireland.

Intelligence was also received that some outlet(s) in Southern Estonia had made F4 pyrotechnics available to non-professionals. However, overall, physical purchases from stores nationally and cross-border were not identified as major problems.

In Italy, it was also considered that persons with specialist knowledge may also sell on their F4 pyrotechnics purchased legally to non-authorised persons, for example, at display events.

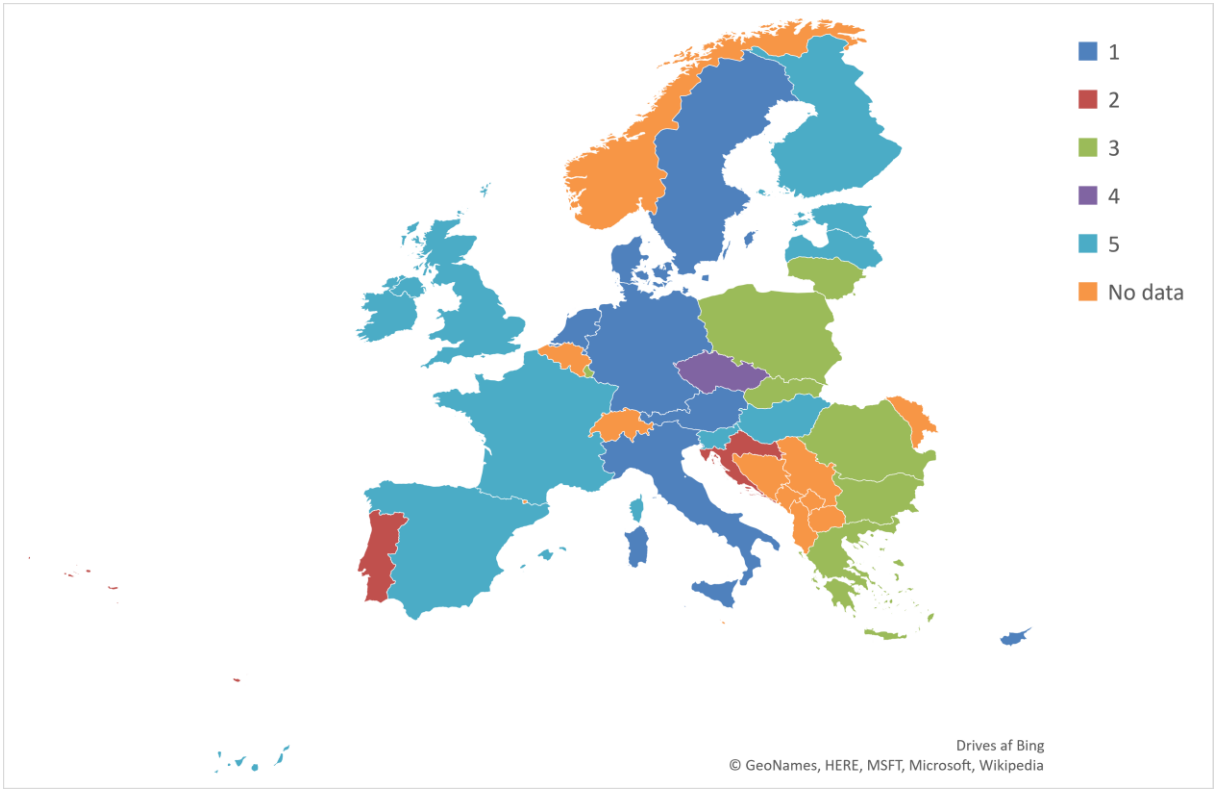
3.3. General characterisation of the EU Member States

To provide a quick overview of the main trends across the EU, three key study variables were analysed for the purpose of placing the Member States into groups.

The variables analysed per country include the number of non-compliant traders identified by this study on the national markets (see Chapter 2), the maximum national prison sentences set for the non-compliant sale of F4 fireworks to the general public (see Chapter 4) and the perceived extent of non-authorised use of F4 pyrotechnics as described by interviewees, survey respondents and other online reports discussed in this Chapter.

Using these variables, we divided the countries into the following 5 groups (see figure 3.2):

Figure 3.2: Overview of the EU Member States divided into 5 groups based on key variables



[50] Czech-Tourist.de: "Feuerwerk aus Tschechien: La Bomba & Co. in Tschechien kaufen?" https://www.czech-tourist.de/feuerwerk.htm

The description of these five groups is as follows:

- Group 1 (Blue): These were identified as comparatively "high non-authorised use countries". However, on the other variables they perform quite differently when compared to each other. While most of these countries were identified as not having any non-compliant traders on the national market, a small number i.e. 1 company, were identified in both Italy and the Netherlands. They also perform differently in terms of the severity of the maximum prison sentences for the illegal sale of F4 pyrotechnics, ranging from 6 weeks to 10 years;

- Group 2 (Orange): These countries (Portugal and Croatia) were identified as having "severe penalties, no non-compliant traders on the market and a very low level of reported non-authorised use";

- Group 3 (Red): This group was identified as having "non-compliant online traders on the market but no or a low level of reported non-authorised use". They have set maximum prison sentences to varying degrees of severity (from 0 years to 8 years).

- Group 4 (Yellow): Czechia was not allocated into any other group as it is quite different from the others. It has a "high number of non-compliant online traders on the market, a high level of reported non-authorised use and does not have the legal possibility to issue prison sentences for the non-compliant sale of F4 pyrotechnics to the public";

- Group 5 (Green): These are countries identified as having "no online traders on the market, less severe prison sentences for the non-compliant sale of F4 pyrotechnics (0 to 2 years) and no or a low level of reported non-authorised use".

3.4. Trends around the non-compliant sale of F4 pyrotechnics to the general public

Respondents were asked to clarify their views on the evolution of the trends in the black market. Most of the feedback on the trends related to the illicit web-shop activity considering that this was said to account for the majority of the problem.

In terms of describing the problem concerning its volume or scale, respondents from Denmark and the Netherlands were able to reference the recent case in Poland; as mentioned, the police authorities seized 80 tonnes of F4 pyrotechnics from a warehouse managed by one of the four web-shops and estimated that one of these non-compliant companies sold about 500 kg of F4 pyrotechnics per day.

Therefore, the interviewees mentioned that depending on the scale of the activities of the remaining web-shops, the actual amount traded daily on the internal market is a multiple of the amount seized. As an observation, the volume of products seized in this single case, provides evidence of a much greater problem than seems to be recognized by the Danish and Dutch stakeholders consulted for this study.

Moreover, in Denmark and the Netherlands, the authorities confirmed that their enforcement activities indicated that the problem is on a significant scale in terms of illegal distribution by criminals and purchasing and use by non-authorised users.

Via the interviews, other respondents simply could not provide an estimate due to lack of knowledge or provided more conservative estimates on the scale of the problem of illegal web-sales in their own country. However, the view of the author of this report, and of some

of the respondents, is that this is due to the hidden nature of the problem that makes it difficult for national authorities to monitor trends with accuracy. [51]

In terms of the number of non-compliant traders in operation, it was generally thought that there are about 10 to 20 active web-shops that account for most of the illicit activity and the numbers are not increasing. Clearly, this is lower than the number of non-compliant retailers identified (i.e. 32) by the online mapping activity (see Chapter 2).

However, it was believed that the non-compliant web-shops have positioned themselves as "go to brands" on the black market, and have become increasingly popular with non-authorised users, meaning that they have been able to scale-up their operations over time.

To assess whether the level of understanding of the Member State authorities and other stakeholders mirrored the non-compliant retail trends of the ground, we compared a series of online survey results to the results of the mapping activity (see Chapter 2).

Table 3.1: Comparison of the online survey results to the mapping of online web-shops

Online survey results	Mapping of online web-shops (see Chapter 2)
On average, 10% of the online retail market were estimated as selling F4 pyrotechnics by authorities and other stakeholders.	Based on the sample analysed, it was identified that 14% of the online retail market sold F4 pyrotechnics, that is, 44 of the 310 companies profiled.
On average, it was estimated that 16% of the firms that sold F4 pyrotechnics online did so without controls (or less than 2% of the overall online retailers).	**73%** of firms selling F4 pyrotechnics (i.e. 32 of the 44 companies) did not perform specialist knowledge controls.

[51] To provide some examples of the types of comments provided around the scale of the problem:

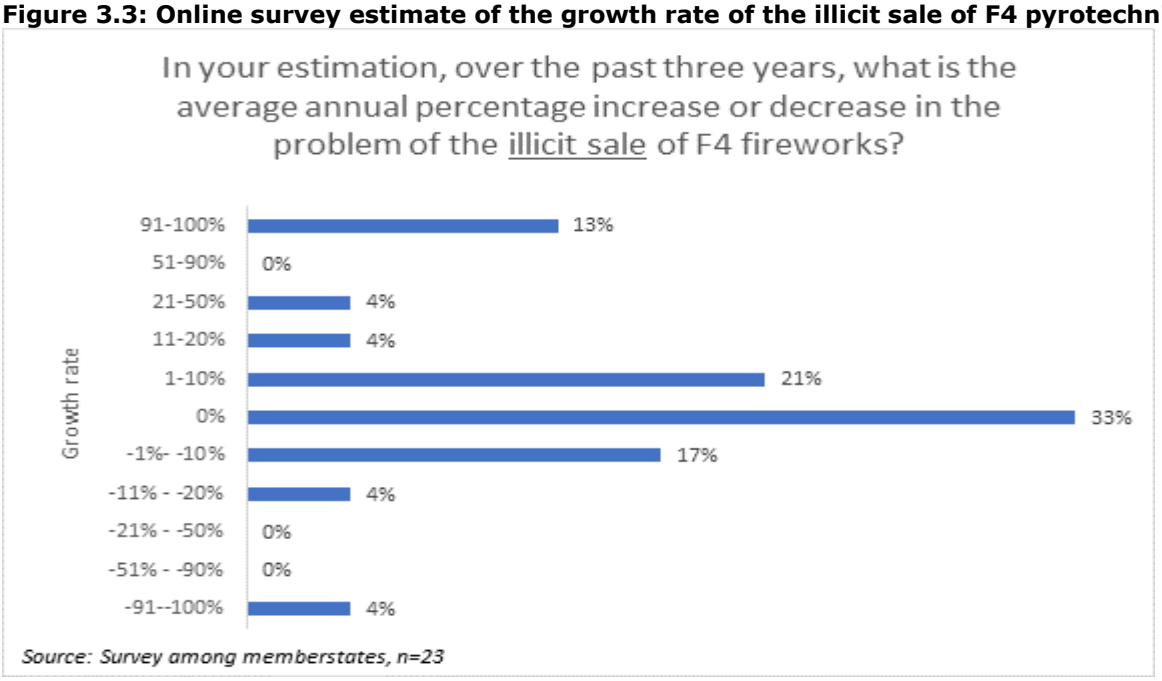
- An Austrian respondent indicated that the online sale of F4 pyrotechnics between Member States is not controlled by official means as shipping is done using anonymous packaging, therefore estimates could not be provided;
- A Cypriot respondent signalled that the illegal intra-EU importing of F4 pyrotechnics was frequent but that it was difficult to establish the exact volume with certainty;
- An Estonian respondent had previously documented illegal use of F4 pyrotechnics brought-in from Poland although overall the situation was not highly problematic;
- A Finnish respondent mentioned that the national customs authority had seized F4 pyrotechnic articles in unmarked packages on several occasions;
- A German respondent noted that there was an increasing problem with the illicit use of F4 flash bangers and shells bought online,
- A German respondent no hard data around the volume of products purchased illegally but recognised the illicit online sales as a problem;
- A Luxembourg respondent suggested that it was possible that F4 pyrotechnics bought online were entering the country although no evidence of this problem had emerged;
- A UK respondent suggested that the amount entering the country was small in quantity
- Feedback from Spain and Romania indicated that there were no issues reported officially to date.
- A Swedish respondent provided evidence of F4 flash bangers being seized by customs that had originated from Germany and Poland. See more on the Swedish seizure here: https://www.svt.se/nyheter/lokalt/skane/1100-bangers-beslagtagna-pa-posten-i-malmo

As Table 3.1. indicates, there is a slight underestimation regarding the average views of the survey respondents and the number of online retailers selling F4 pyrotechnics as identified by the mapping activity (see Chapter 2).

However, considering that 73% of companies identified as selling F4 pyrotechnics online by the mapping activity did not perform specialist knowledge controls, the problem is not as small as assumed by the authorities and other stakeholders participating in the study consultation processes.

We also asked the survey respondents to comment on the estimated growth rate of the illicit online sale of F4 pyrotechnics, as indicated in Figure 3.3.

Figure 3.3: Online survey estimate of the growth rate of the illicit sale of F4 pyrotechnics?



In terms of the growth rate, most authorities and other stakeholders considered that the situation was relatively stable with one third indicating that the problem was neither getting worse nor improving, and about 40% indicated that the growth rate was either reducing or increasing by 1 to 10%.

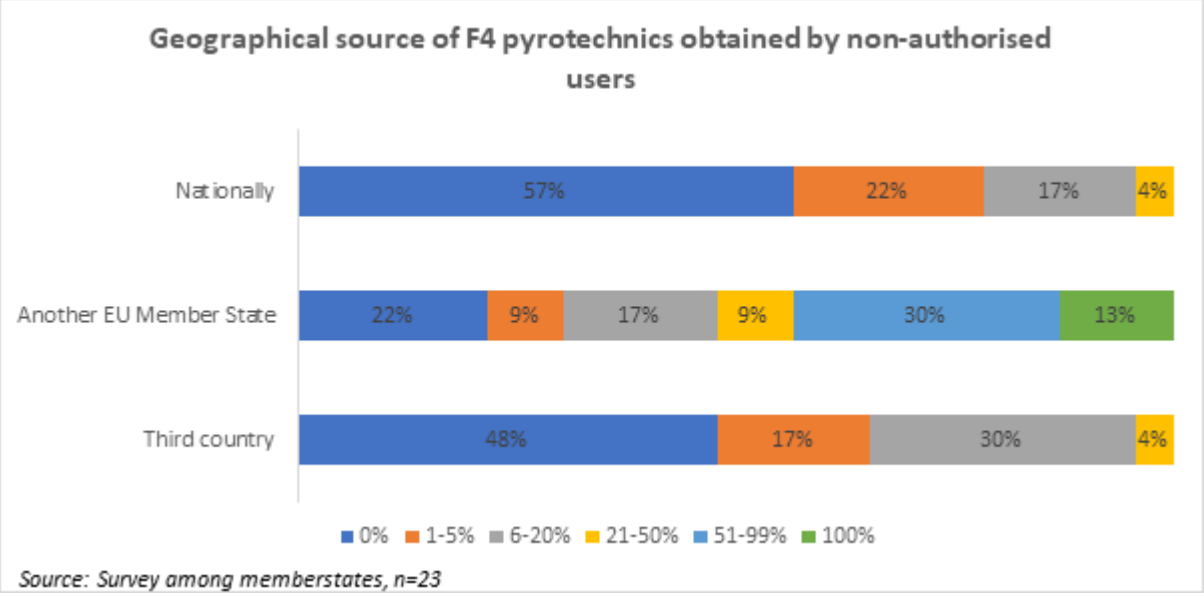
Again, it was difficult to determine the extent to which the reporting of these trends matched reality considering the hidden nature of the problem and the ability of Member States to monitor the illegal activities.

However, at the same time, the problem is likely to impact the EU Member States to different extents. A key factor mentioned was that some Member States were recognised as having more extensive user markets, therefore, one may expect country differences in the growth rate of the non-authorised use of F4 pyrotechnics.

We also asked respondents to estimate the proportion of F4 pyrotechnics purchased online illegally from a non-compliant trader based in their home country, another EU Member States or from a third country, see Figure 3.4[52].

[52] Each respondent therefore inserted three separate values for the three separate geographical sources that together added up to 100%.

Figure 3.4: Geographical source of F4 pyrotechnics obtained by non-authorised users



According to the distribution of responses, it seemed that most respondents did not consider the geographical source as their own country or a third country. Rather, the prevailing view was that F4 pyrotechnics obtained online by non-authorised users were purchased from companies located in other EU Member States.

Again, this would suggest that a combination of European and national efforts are required to address the problem.

3.5. The impact of the non-compliant distribution of F4 pyrotechnics on the postal and courier services

This section provides specific attention to the role that courier and postal services play in the cross-border online illicit sale of F4 pyrotechnics to members of the general public based on interview feedback from two EU-wide private courier firms and a Dutch national postal services company.

The nature of the problem as described by the courier and postal company interviewees

The fundamental issue that courier and postal companies have with the illicit cross-border sale of F4 pyrotechnics is that they find it difficult to prevent their services from being hired by the non-compliant traders.

Illicit traders often present themselves at parcel shops / postal offices in their own country (Czechia and Poland were mentioned) as private anonymous persons and pay in cash for a shipment to another EU Member State, typically to Western and Northern Europe. The packages are also dropped off in small volume at different parcel shops / postal offices; therefore, there is no trace of the business entity that has submitted the package.

To further conceal themselves, non-compliant traders sometimes submit their packages in parcel shops / postal offices in EU Member States other than their own (such as Belgium, Germany, the Netherlands) for distribution across the EU. It was suggested that some non-compliant traders have warehouse facilities in Germany to help conceal their shipment activities even though their head offices are in Czechia and Poland.

Persons wishing to send pyrotechnics via courier service providers must comply with the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) that requires the use of appropriate safety labelling and packaging, certified couriers

trained to handle packages with explosive contents using appropriate transportation methods, while considering the volume restrictions imposed on the mailing of different classes of pyrotechnics.[53] Moreover, it is not permitted to distribute fireworks via non-certified postal services according to the ADR and the postal laws and regulations agreed to by the Universal Postal Union (UPU) member countries which have adopted the Postal Act.

However, the courier and postal services providers typically recruited by the non-compliant traders are not certified or trained to handle such goods and are probably considered as a comparatively low-cost transportation solution. Consequently, unknowingly, the courier service providers treat the unlabelled goods without special consideration in their distribution systems.

Reportedly, this trend has presented a significant potential safety hazard to EU-wide courier operators, as any mishandling of the explosive materials could possibly result in significant accidents to personnel and damage to company property while in transit; further issues were also identified such as the potential risk of one of the unlabelled packages ending-up mistakenly in an interfacing air transportation distribution channel. The cost impact of this problem on the courier business operations is explained in more detail in Chapter 5.

The scale of the problem as described by the courier and postal company interviewees

According to the courier and postal interviewees, the scale of the problem of the illegal distribution of F4 pyrotechnics is escalating and is difficult to address.

In terms of the volume of illicit packages actually seized, the numbers varied between the companies and ranged from 20 to 1000 packages per year. As an observation, the differences in the number of packages seized could be due to the difference in the cost of the courier / postal services, with the low cost provider interviewed handling a comparatively larger volume of packages and being more attractive cost-wise to the non-compliant traders. Also, some of the firms had established monitoring systems that were likely to have different levels of comparative effectiveness in identifying the unlabelled packages. For instance, firms using trained dogs would likely identify more packages than companies monitoring the style of the packaging only.

However, it was recognised by the interviewees that the scale of the problem was likely much greater considering that the measures used to identify the packages were not foolproof and were only used intermittently.

In terms of the general evolution of the trends, the estimates provided varied between 20 to 40% increase per year – these were largely based on the general increase in online sales, but also in terms of the frequency of the number of packages containing F4 pyrotechnics seized compared to previous years.

Moreover, based on the identification of illicit packages in their distribution systems, the courier services companies interviewed considered that the number of illicit operators was relatively small although growing incrementally with estimates provided of 10 to 20 companies based in Czechia and Poland.

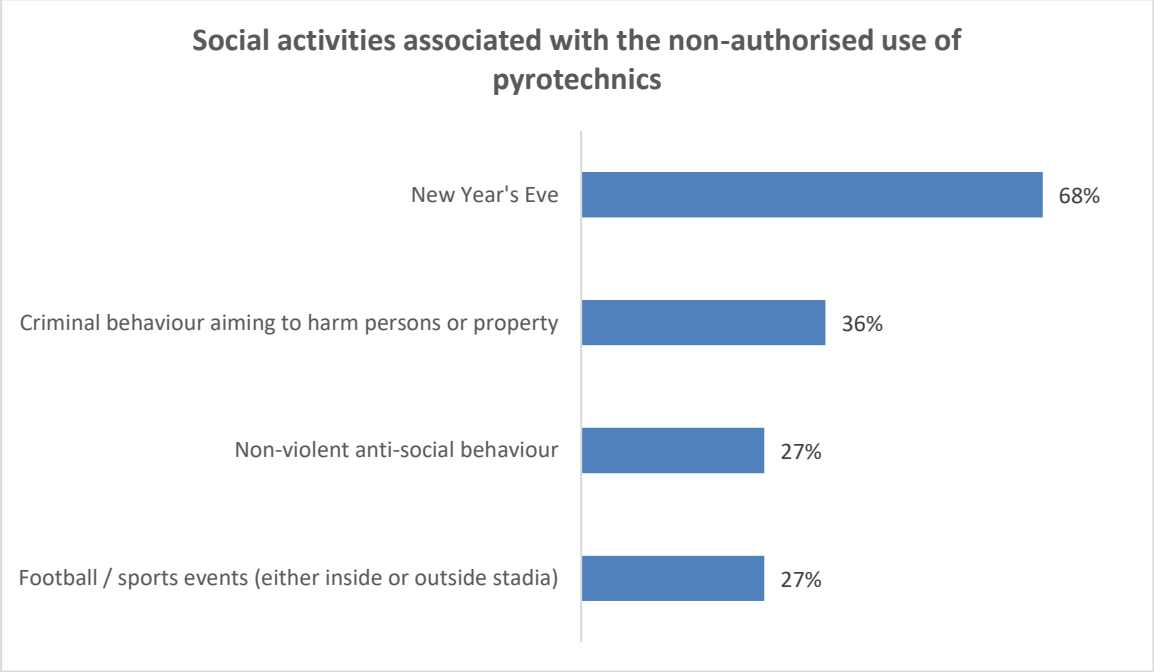
[53] European Agreement concerning the International Carriage of Dangerous Goods by Road: https://www.unece.org/trans/danger/publi/adr/adr_e.html

3.6. Trends around the non-authorised use of F4 pyrotechnics by the public

The characterisation of the trends around the illicit use of F4 pyrotechnics faced similar challenges as those around the illicit sale; some respondents were able to provide evidence to varying degrees while others did not have any information at hand or felt that misuse did not occur frequently.

However, the feedback received provided some indication of the main activities where misuse takes place typically, see Figure 3.5[54].

Figure 3.5: Social activities associated with the non-authorised use of pyrotechnics



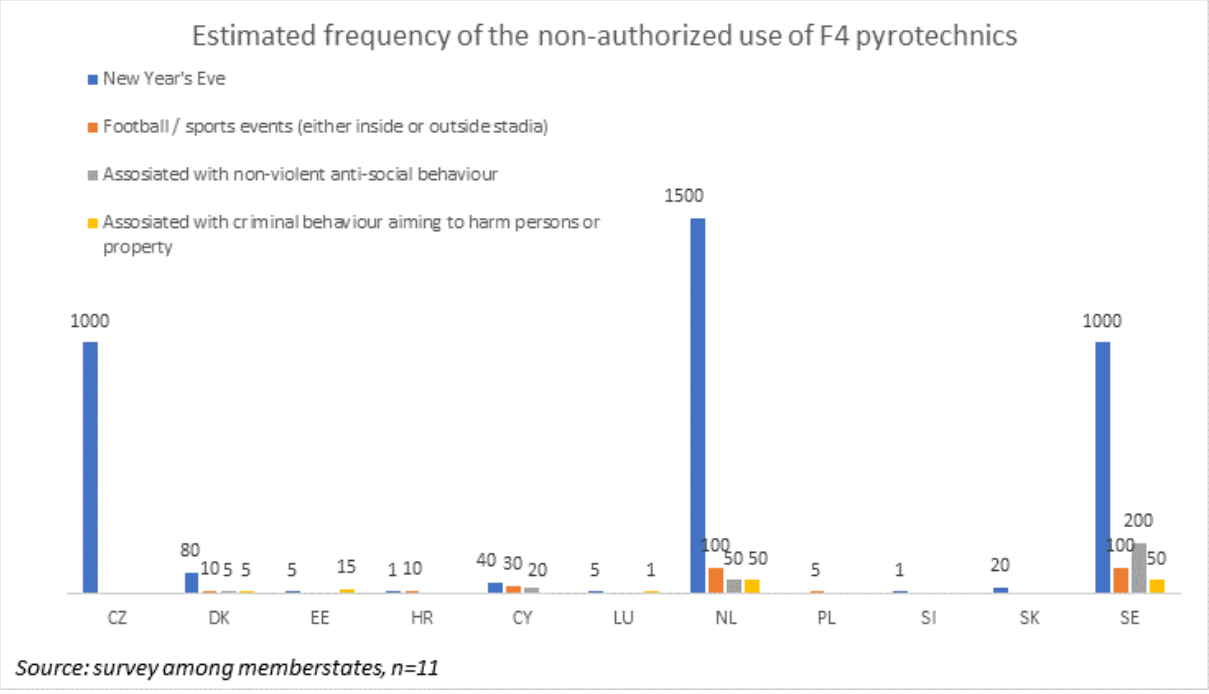
As expected, the New Year's Eve celebrations were considered as the primary event where non-authorised use occurs, although to a lesser extent the misuse is associated with criminal behaviour to harm persons or property or non-violent anti-social behaviour.

Some survey respondents also associated the use with football and sports events. Previous research has also indicated that F4 pyrotechnics may be misused at sport events although Category P1 / P2 flares were suggested as the most frequently used.[55]

Survey respondents were also asked to comment on the frequency of the events. In this case, a lower number of respondents responded to the question, indicating the difficulties in providing a meaningful response to the answer for some. Please see Figure 3.6.

[54] Respondents were asked to select one or more of the possible options.
[55] Smith, T (2016) Pyrotechnics in Stadia: Health and Safety Issues relating to the use of pyrotechnics in football
stadia. Available at:
https://www.uefa.com/MultimediaFiles/Download/uefaorg/Stadium&Security/02/48/11/68/2481168_DOWNLOAD.pdf

Figure 3.6: Estimated annual frequency of the non-authorised use of F4 pyrotechnics linked to different types of events / activities



Source: survey among memberstates, n=11

The responses suggested an uneven distribution of non-authorised usage across the Member States, with the respondents in Czechia, the Netherlands and Sweden suggesting extensive illegal usage, along with other key countries where problems have been reported including Denmark and Cyprus.

Although a response was not received to this question via the online survey, qualitative feedback suggested that there was extensive use of F4 pyrotechnics in Austria and Italy by non-authorised persons.

The qualitative feedback suggested that there was variation in the non-authorised use of F4 pyrotechnics. Typically, it seemed that countries where there was common usage of legal fireworks by private persons were more likely to be associated with non-authorised use of F4 pyrotechnics e.g. Czechia, Denmark, Germany, Netherlands and Sweden.

For example, while fireworks usage to various degrees is common on New Year's Eve across the EU, the use of fireworks by private persons on this holiday varies by Member State. Several countries were cited (Denmark, Germany, Netherlands, Sweden) where members of the public go onto the streets to set-off fireworks for this event. While most of the fireworks used are likely to fall into the F2 and F3 categories, the usage is often unsafe given the proximity to the members of the public and property and the unorthodox methods used to set-off the fireworks; moreover, the usage is often unauthorised. In Czechia, F4 pyrotechnics were said to be used by private persons on their home premises for New Year's Eve and birthday celebrations.

In Cyprus, there appeared to be some moderate non-authorised usage of F2 to F4 pyrotechnics purchased from firms in other EU Member States due to recurring non-licensed events.

In the Netherlands, misuse of F4 pyrotechnics at New Year's Eve has been well documented by the consumer safety body "VeiligheidNL" through an analysis of accident data (see

Chapter 5).[56] [57] The Austrian authorities considered that there are a lot of incidents caused by the misuse of F4 pyrotechnics each year including around the New Year's Eve period.

General misuse of F4 pyrotechnics not linked to any events was also documented and sometimes this has criminal or antisocial undertones. In Denmark, in 2017, the authority interviewed noted that there had been 567 cases involving the misuse of F4 pyrotechnics resulting in 501 charges. Further cases of F4 pyrotechnics misuse in Denmark are contained in the newspaper articles in the footnotes, one involving the death of a person using an F4 firework on New Year's Eve.[58] [59] [60]

In Sweden, it was mentioned that there is almost daily reporting of misuse of bangers or flash bangers; the article in the footnote describes a case of banger being thrown into a school cafeteria. Fireworks are even used as weapons as part of conflicts between local criminal groups. [61]

In Austria and the Netherlands, there have been several cases where the flash composition from F4 pyrotechnics have been used to blow-up ATM machines, including a recent case in 2019 that involved Italian F4 flash bangers as reported in the Dutch newspaper 'Telegraaf'.[62] In the Netherlands, there was one terrorist case where there was an intention to use F4 pyrotechnics to inflict serious damage.

Other countries indicated that misuse of F4 pyrotechnics was infrequent and not associated with any particular event. For example, in Estonia and Finland, the very limited illicit use of F4 pyrotechnics was considered not to be linked to any particular national holiday. In Luxembourg, there are documented cases of a small number of acts of vandalism that have occurred prior to the New Year involving F4 pyrotechnics.

As mentioned, the dangerous use of (F4) pyrotechnics are promoted on YouTube and other social media, suggesting that there is subculture associated with the dangerous use of fireworks. The videos show the usage of the F4 pyrotechnics, the opening of parcels received containing fireworks, vandalism and risky practices such as igniting the fireworks in proximity to others and in urban areas. The chat feeds indicate encouragement from some members of the general public, occasionally requesting feedback on where the products used can be purchased. Examples of these practices are contained in the footnote, including opening of unlabelled parcels containing pyrotechnics by French and Dutch

[56] Veiligheid NL (2018) Accidents with fireworks
[57] Veiligheid NL (2018) Type of fireworks and injury: fireworks accidents 2017-2018
[58] BT (2015): "Krysantemum-bomber dræber familiefar og to unge: - Men de sårede er reddet!". Available at: https://www.bt.dk/danmark/krysantemum-bomber-draeber-familiefar-og-to-unge-men-de-saarede-er-reddet
[59] BT (2015): "Se videoen: Krysantemumbombe eksploderer tæt på menneske-mængde - Nu efterlyser politiet vidner".
Available at: https://www.bt.dk/krimi/se-videoen-krysantemumbombe-eksploderer-taet-paa-menneske-maengde-nu-efterlyser-poli

[61] SamhällsNy (2018): " Poliser på skolbesök attackerades med banger".
Available at: https://samnytt.se/poliser-pa-skolbesok-attackerades-med-banger/
[62] De Telegraaf (2019): " Explosievendienst haalt plofkraakspullen en zwaar vuurwerk uit woning". Available at: https://www.telegraaf.nl/nieuws/3368195/explsoievendienst-haalt-plofkraakspullen-en-zwaar-vuurwerk-uit-een

consumers and dangerous use of fireworks in Germany and in Malmö, Sweden on New Year's Eve.[63] [64] [65] [66] [67] [68] [69] [70] [71] [72]

One video shows the very dangerous use of fireworks on New Year's Eve in Berlin in 2015; feedback from a pyrotechnics expert indicated that one of the fireworks set-off in the video likely fall into the F4 or F3 categories.[73] [74] However, F3 pyrotechnics are restricted to professionals users only in Germany. The Handelsblatt article in the footnote explains the dangers of New Year's Eve in Berlin and other German cities due to poor use of pyrotechnics by the general public, and the seizure in 2017 of several tonnes of illegal pyrotechnics by the police from non-authorised users.[75]

Given that non-authorised users use social media to promote and sell F4 pyrotechnics to the general public, in the Netherlands, an enforcement authority recently implemented a programme to take down 700 Instagram and Facebook accounts mainly of teenagers that were active in promoting the illicit use and sale of small amounts of F4 pyrotechnics.

3.7. Key conclusions and recommendations

Conclusions

- Evidence collected on the illegal sale of F4 pyrotechnics online to the general public has indicated that it is a significant black market enterprise for Organised Crime Groups (OCGs). A recent investigation in Poland in December 2018 resulted in the seizure of 80 tonnes of F4 pyrotechnics, enough to fill four large shipping containers. After assessment of the evidence, it was estimated that the OCG shipped 1000 kg of F1 to F3, and 500 kg of F4 pyrotechnics to different Member States per day;

- The EU-wide research of the illegal sale of F4 pyrotechnics to the general public experienced difficulties because the phenomena is hidden from the authorities; the commercial transactions take place online between non-compliant web-shops and non-authorised users, with the products shipped in unlabelled parcels from one Member State to another, making official monitoring of the situation highly problematic;

- The extent of the illicit purchase and use of F4 pyrotechnics by non-authorised users is likely to vary significantly between Member States. However, while it is probably the case that some Member States experienced limited negative activities, the

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[63] Youtube (2018): https://www.youtube.com/watch?v=0pjXxGi3ca8&list=FLOTEx2XLzGdnoEfPJjU_IIg
[64] Youtube (2015): https://www.youtube.com/watch?v=I1FidvQw_60
[65] Youtube (2014): https://www.youtube.com/watch?v=0MWhYKCIeGk&t=0s&index=32&list=FLOTEx2XLzGdnoEfPJjU_IIg
[66] Yotube (2017): https://www.youtube.com/watch?v=d1KzCa7E7hk&sns=em
[67] Youtube (2015): https://www.youtube.com/watch?v=f83YUhey1Gs
[68] Youtube (2016): https://www.youtube.com/watch?v=WmlG8euwgaU
[69] Youtube (2018): https://www.youtube.com/watch?v=pULvShqEEps
[70] Youtube (2018): https://www.youtube.com/watch?v=I3RAFp1A0Fs
[71] Youtube (2017): https://www.youtube.com/watch?v=AhYNMbpE3yU
[72] Youtube (2016): https://www.youtube.com/watch?v=WmlG8euwgaU
[73] Youtube (2015): https://www.youtube.com/watch?v=un4EUKVT2-k
[74] The first part of the video indicates the use of a medium size shell (probably a 50-75 mm shell). If it was a 75mm shell this would clearly mean that it was an F4; if it was a 50mm shell, it could be an F4 product; but it could also be an F3 product (battery of 50mm shot tubes). However, there is poor use of F2 to F3 pyrotechnics throughout.
[75] Dobush, Grace (2018): "Germany's four-day, €137 million fireworks season begins". Available at: https://www.handelsblatt.com/today/opinion/happy-new-year-germanys-four-day-137-million-fireworks-season-begins/23811140.html?ticket=ST-2927474-3rl4YB0HwdXYdYzT3crG-ap1

volumes of F4 pyrotechnics seized in the Poland case in December 2018 suggested a much bigger problem than that reported by authorities and other stakeholders responding to the study consultation processes;

- Authorities and other stakeholders have underestimated the proportion of online retailers that sell F4 pyrotechnics online without specialist knowledge controls. Based on the sample analysed by the mapping activity, it seemed that the proportion of non-compliant traders is around 73% whereas the average online survey response suggested a figure of 16%;

- It was confirmed that online web-shops based in other Member States are the main source of F4 pyrotechnics purchased for use by non-authorised members of the general public. Less common sources include the EU-wide physical transportation of F4 pyrotechnics by Organised Crime Groups (OCGs); the direct or indirect sale of F4 flash bangers from licensed European producer(s) to OCGs; the intermittent illegal production and sale of F4 pyrotechnics by unlicensed criminal producers; and distribution by small-scale intermediaries;

- The responses suggested an uneven distribution of non-authorised usage across the Member States, with Czechia, Denmark, Germany, the Netherlands and Sweden appearing to suffer the most severe problems, with less acute issues reported in Belgium, Cyprus, Estonia, Finland, Luxembourg, Slovakia and the United Kingdom etc. Other countries such as Spain, Portugal and Romania reported no problems whatsoever;

- Unsurprisingly, New Year's Eve was noted as the most common holiday where (F4) fireworks are misused by the general public. To a much lesser extent, F4 pyrotechnics are used as part of other criminal activities to harm persons and/or damage property;

- Postal and courier companies are negatively affected by these trends as they are unable to prevent the anonymous use of their services by non-compliant traders. The non-compliant distribution of unmarked parcels poses serious risks to postal workers and company property and is in clear breach of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) and the Postal Act of the Universal Postal Union (UPU).

Recommendations

- The feedback suggested that the use of sniffer dogs to detect (F4) pyrotechnics contained in unlabelled packages had been an effective measure when used by the courier and postal services in their warehousing facilities. It is suggested that these types of activities are scaled-up with the support of the Member States to enhance the detection of (F4) pyrotechnics transported illegally.

- Echoing the recommendations from Chapter 2, more systematic screening and controls on web-shops by market surveillance and enforcement authorities seems appropriate in the light of the results of this study.

4. ASSESSMENT OF THE LAW AND ENFORCEMENT FRAMEWORK TO ADDRESS THE NON-COMPLIANT SALE AND USE OF F4 PYROTECHNICS

This Chapter provides an assessment of the performance of law and policy framework established to address the non-compliant supply and use of F4 pyrotechnics.

4.1. Enforcement framework for pyrotechnics

While it was not the role of the study to map-out the enforcement framework and systems for each Member State in detail, information was collected on the general approaches established.

Typically, Member States have dedicated an authority to manage the enforcement of the EU and national legislation related to pyrotechnic articles. This authority is likely to be supported or complemented by other authorities (such as authorities competent for explosives, inspectorates, mining authorities, customs authorities or local authorities) that have specific types of competences related to the inspection of pyrotechnics imported to the EU, manufacture sites, storage sites, distribution processes and retail sites. Police services often have a role in these processes and have duties to prevent non-authorised users from using F4 and possibly other categories of pyrotechnics, depending on the national legislation.

Member States indicated generally that periodic inspections of (samples) of licenced premises were implemented especially in the run up to the New Year. This is typically supported by licensing systems and databases that support the monitoring of licensed premises and specialist knowledge users.

The Directive also provides for a coordinated approach to market surveillance at European level through the Administrative Cooperation Group (AdCo) on Pyrotechnic Articles, where Member State' market surveillance authorities have the opportunity to share market information and collaborate on joint enforcement actions.

However, despite these efforts, the feedback suggested that there are some gaps in the current enforcement approach as explained in the following sections.

4.2. Effectiveness of the legal and policy framework

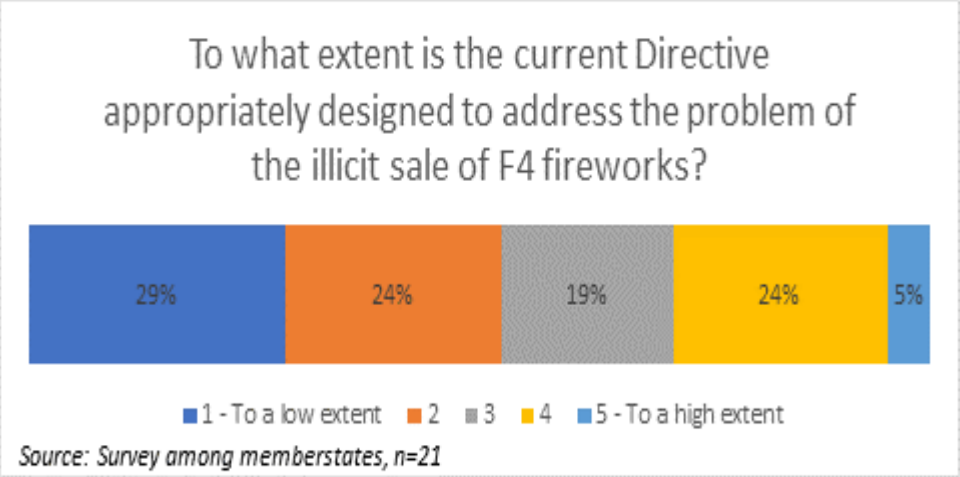
This section provides feedback on a variety of issues relating to the effectiveness of the legal and policy framework in addressing the problem of the illicit sale and use of F4 pyrotechnics.

4.3. Overall appropriateness of the Directive in addressing the problem of the illicit sale and use of F4s

When considering the interview feedback, as could be expected, the views around the performance of the Directive in addressing the problem in the study scope largely differed based on whether respondents initially considered there to be a significant issue in the EU-wide sale and use of F4 pyrotechnics.

This pattern was also reflected in the results to the online survey but overall it was recognised generally that the initial design of the Directive had not considered sufficiently the need to limit the illegal sale of F4 pyrotechnics, as indicated in Figure 4.1.

Figure 4.1: To what extent is the current Directive appropriately designed to address the problem of the illicit sale of F4 pyrotechnics?



The interview feedback provided some clues to the reasons for these responses. To begin, it was stressed that the Directive is mainly designed to deal with the legal and standardised design, manufacture, testing and labelling of pyrotechnic articles, including fireworks. While the Directive requires that F4 pyrotechnics should only be handled and used by users with specialist knowledge, the practice of the (non-compliant) online and cross-border sale of F4 pyrotechnics are not anticipated by the Directive. Therefore, the (criminal) intent of some companies to supply the F4 pyrotechnics using these methods are not addressed specifically.

Connected to this, it is not straightforward for an authority in one Member State to request successfully the taking down of a website managed by an illicit trader based in another Member State; also, this is further compounded by the fact that the Directive leaves it to the Member States to determine the penalties for infringements to the Directive's provisions. For example, interviewees commented that as the sale of F4 pyrotechnics to the general public in Czechia is not a criminal act, this limits the options available to the Czech authorities to effectively to respond to an enforcement request from another Member State.

A further issue is that the responsibilities among national authorities for legal enforcement around the illicit sale and use of F4 pyrotechnics are sometimes not well defined in the national legislation. Criminal activities are often the responsibility of police authorities and not market surveillance authorities, however, the illicit sale and use of F4 pyrotechnics may not be considered as a major police priority.

4.4. Problems in verifying the authenticity of specialist knowledge licenses for pyrotechnics professionals issued by national authorities based in other Member States

The Directive requires Member States to ensure that only those with specialist knowledge handle and use F4 pyrotechnics, however, there are no harmonised rules regarding how Member States meet this requirement, meaning that the legal, training and knowledge requirements differ per country as well as the methods used to demonstrate that users have the necessary specialist skills.

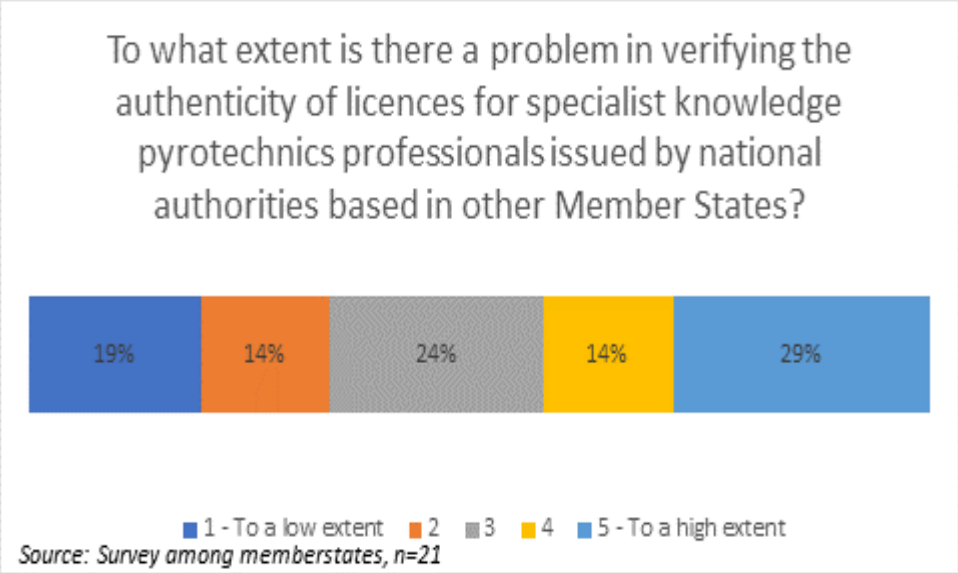
For example, in Austria, the online sale of F3, F4, T2 and P2 pyrotechnics is not permitted. Persons need to purchase F4 pyrotechnics physically from a licensed store, proving their expertise using an Austrian firework license ID card and provide an accompanying letter from the relevant authority.

In Denmark, there is a register for persons with specialist knowledge that can be accessed by suppliers; this relates to two specialist knowledge schemes, one for stage fireworks only (T1 and T2), and one for display (F4) fireworks. However, while this system makes it possible for suppliers to access official data, the information is provided only in Danish. Therefore, it would be difficult to see how the information could be verified by suppliers across the EU.

Regarding the UK, an official licensing scheme is not established, and suppliers are required to verify whether their customers have the necessary specialist knowledge as specified in the UK regulation.[76]

As indicated in Figure 4.2, the survey respondents generally suggested that there are moderate to high problems in demonstrating specialist knowledge in a cross-border context.

Figure 4.2: To what extent is there a problem in verifying the authenticity of licences for specialist knowledge pyrotechnics professionals issued by national authorities based in other Member States?



However, the interview feedback from stakeholders did not contain many specific examples of such problems occurring. Rather, it was underlined typically that in practical terms it was unlikely that suppliers would be able to establish with confidence whether a licence or document issued in another Member States demonstrated that a person had specialist knowledge considering that there are no procedures or tools in place to support verification.

However, an authority indicated that one of the web-shops that was subject to the investigation in Poland provided a fake F4 and storage license to a supplier in Germany who retained a copy of the document as part of the sales documentation; this certificate demonstrated that the web-shop manager had completed a training course on fireworks but it was neither a valid specialist knowledge nor a national storage license.[77]

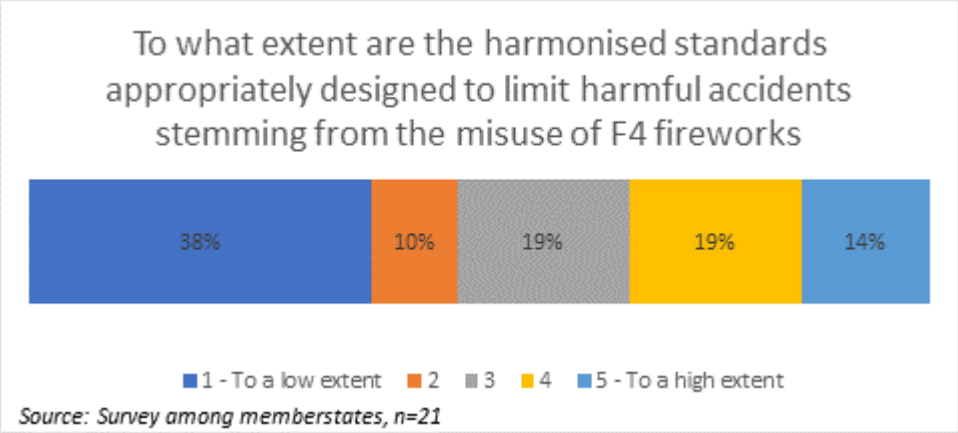
[76] The Pyrotechnic Articles (Safety) Regulations 2015 Schedule 4 provides several specialist knowledge requirements including the need for persons to have "undertaken training recognised in the fireworks business in relation to the category F4 firework which is to be made available to that individual". Specialist knowledge users are also required to hold relevant insurance and demonstrate previous experience of using F4 pyrotechnics.

[77] Another example was provided of a Dutch man registering a fireworks company with a chambers of commerce who later purchased F4 pyrotechnics from Portugal; the supplier in Portugal accepted

4.5. The role of harmonised standards in limiting the misuse of F4s and related accidents

To prove that their products are in conformity with the essential safety requirements of the Directive, manufacturers can choose (and in most cases do choose) to comply with the relevant European harmonised standards when producing F4 pyrotechnics. The standards, however, do not impose upper limits for the Net Explosive Content (NEC) of category F4 pyrotechnics but require instead that F4 fireworks are safe when used in the intended manner. Therefore, survey respondents were asked to identify if there were any issues with the standards with regard to their role in limiting harmful accidents due to the misuse of F4 pyrotechnics – see Figure 4.3.

Figure 4.3: To what extent are the harmonised standards appropriately designed to limit harmful accidents stemming from the misuse of F4 pyrotechnics



Although there were differences in opinion to this online survey question, respondents did not consider that the standards can prevent the number of accidents to a high extent.

However, interviewee feedback tended to suggest that the harmonised standards do or could not play an effective role in preventing accidents caused by the non-compliant sale and use of F4 pyrotechnics. Therefore, there were not any strong criticisms about the design of the standards, and most interviewees did not see a need for a future revision to address the harmful accidents caused by the misuse of F4 pyrotechnics.[78]

4.6. The extent to which the Directive is evenly enforced across the Member States

As mentioned, authorities and postal service interviewees mentioned that the web shops selling the F4s online are typically based in Czechia and Poland. The results of the online mapping research – see Chapter 2 – also suggested (possible) illegal online sale activities in Bulgaria, Greece, Lithuania, Luxembourg, Netherlands, Slovakia and Romania.

For this reason, survey respondents questioned whether the Directive was evenly enforced as intended across the Member States, as reflected in the survey results indicated in Figure 4.4.

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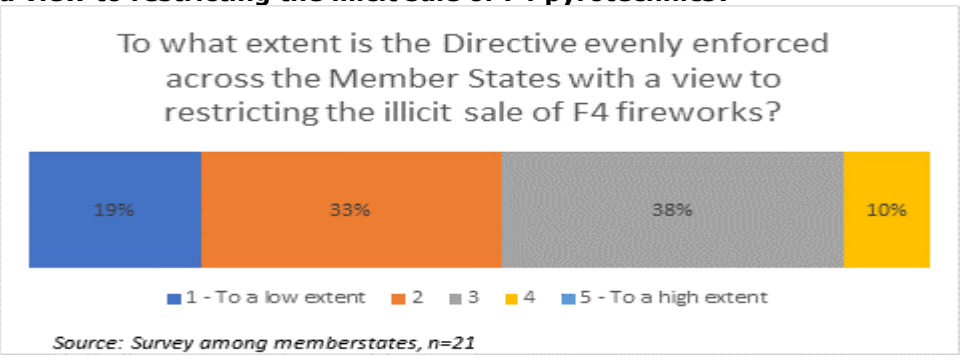
the document as evidence that this person had met the necessary specialist knowledge and storage requirements but this was not the case.

[78] Some respondents mentioned that some F3s should be categorised as F4s given their risks to the public. This would however require a revision of the relevant harmonised standards.

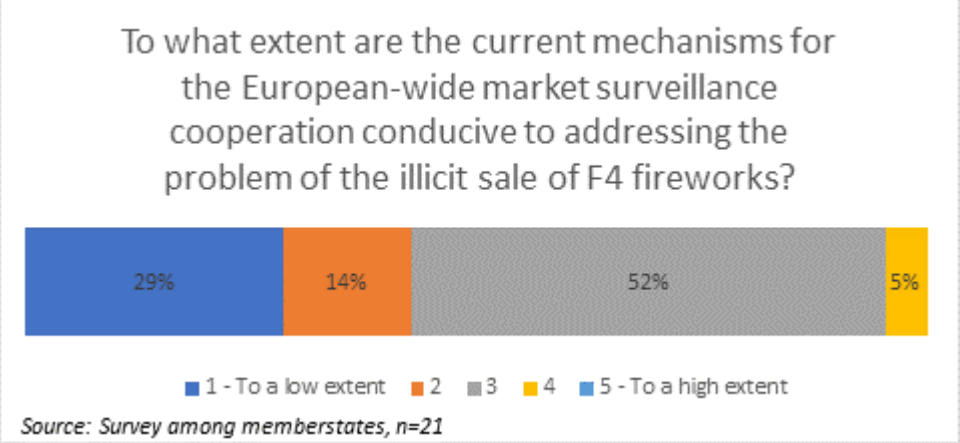
Figure 4.4: To what extent is the Directive evenly enforced across the Member States with a view to restricting the illicit sale of F4 pyrotechnics?



4.7. To what extent is the current mechanisms for the European-wide market surveillance cooperation effective

The issue was explored as to whether the current mechanisms in place to facilitate the EU-wide market surveillance cooperation are effective with regard to the specific issue of addressing the problem of the illicit sale and use of F4 pyrotechnics, i.e. within the Administrative Cooperation Group (AdCo) on Pyrotechnic Articles. Those responding to the survey were moderately to negatively critical of this EU collaboration forum as indicated in Figure 4.5.

Figure 4.5: To what extent are the current mechanisms for the European-wide market surveillance cooperation conducive to addressing the problem of the illicit sale of F4 pyrotechnics?



Some of the interview respondents were more nuanced, suggesting that while progress had been slow, the AdCo Group on Pyrotechnic Articles had become increasingly interested in this issue over time and resources were being invested in the matter by Europol and Eurojust. However, other responses were more critical, indicating that while good initiatives are discussed, they rarely get off the ground in practice. The main reasons mentioned was the AdCo Group was typically not used as a forum to discuss criminal activities especially those conducted by non-licensed entities, and that there was lack of strong EU-wide institutional links between the relevant authorities that are focused on addressing the problem.

To be more precise, the matter of market surveillance cooperation to address this issue seems to be challenging; for example, as mentioned already, requesting authorities in other countries to remove websites, or identifying the relevant official in the police service or similar relevant authority to commence building a case against an illicit trader have been noted as difficult. One respondent mentioned that the AdCo Group on Pyrotechnic Articles does not seem to be the correct forum for tackling this issue as it is more than likely that

the police authorities will need to be ultimately requested to manage (cross-border) cases, and unfortunately not all the police authorities of the Member States participate in the activities of this AdCo Group. Therefore, participation by the relevant authorities is unevenly distributed across the Member States.

It should however be noted that the Directive, and Regulation (EC) 765/2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products, introduced other legal obligations for national market surveillance authorities to follow apart from the collaboration via the AdCo Group; national authorities do not always seem to be aware of these additional obligations to cooperate with national authorities of other Member States.

4.8. To what extent are the current national penalties dissuasive for the sale of F4 pyrotechnics to the general public

Respondents were asked to provide information on their own national penalties for the non-compliant sale of F4 pyrotechnics to the general public and to indicate whether they considered them to be dissuasive as required by the Directive, see Figure 4.6.

Figure 4.6: To what extent are the penalties in your own Member State dissuasive?

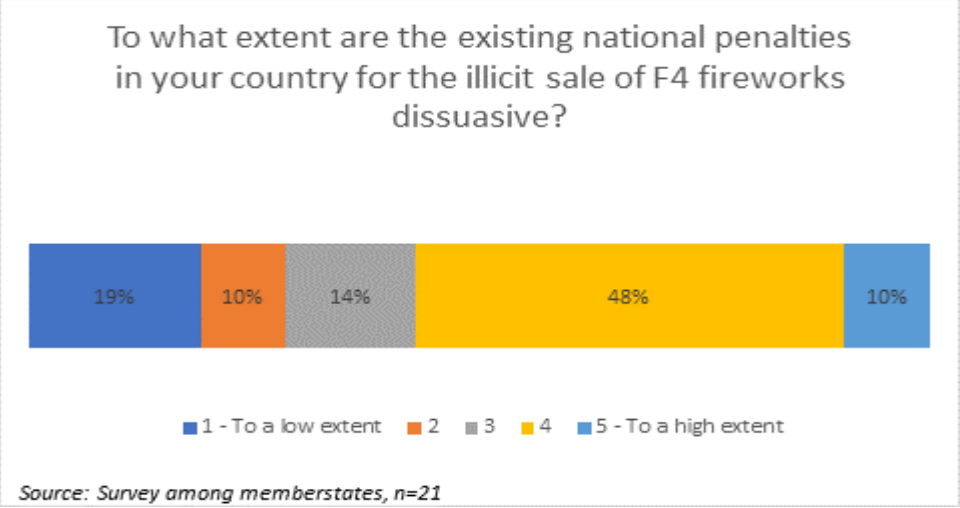
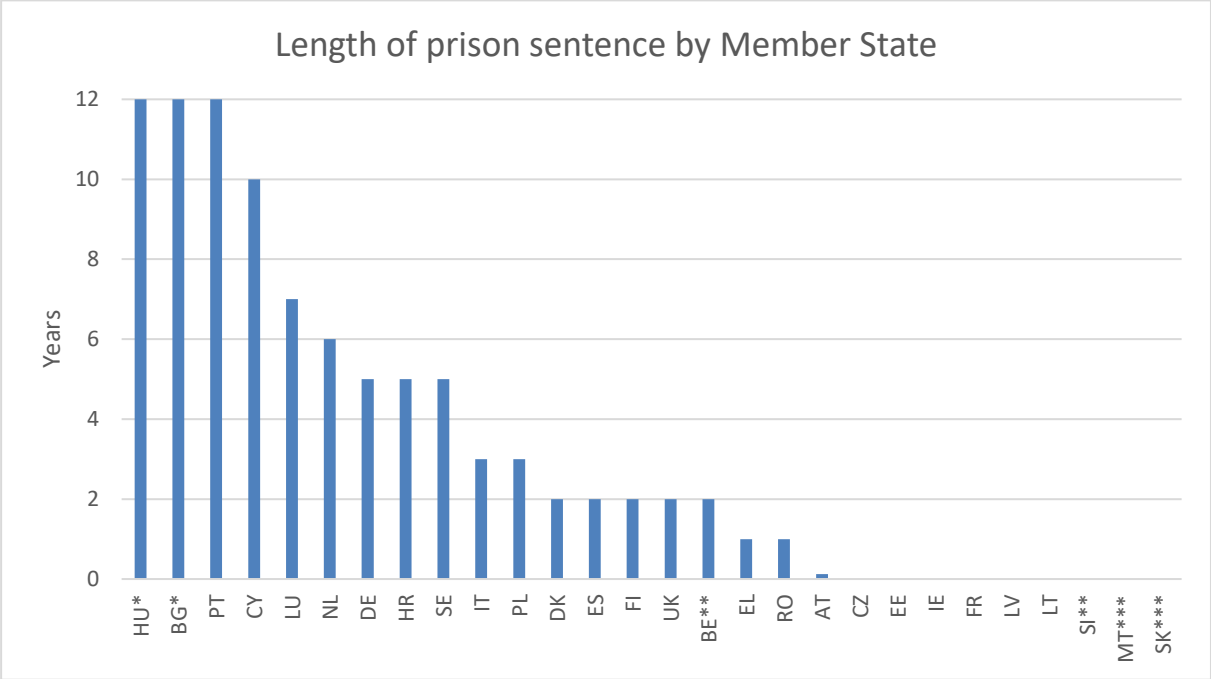


Figure 4.6. illustrates that respondent' opinion is generally weighted towards the view that national law is currently adequate in the level of the deterrent that it provides.

However, from inspection of the national penalties, there is variation in their severity between countries, please see Annex 1 for an overview of the national penalties.

Where criminal law has been used to define the types of penalties that can be issued for the non-compliant sale of F4 pyrotechnics, some countries have set prison sentences, the maximum periods for which are indicated in Figure 4.7.

Figure 4.7: Comparison of the maximum prison sentences by Member State

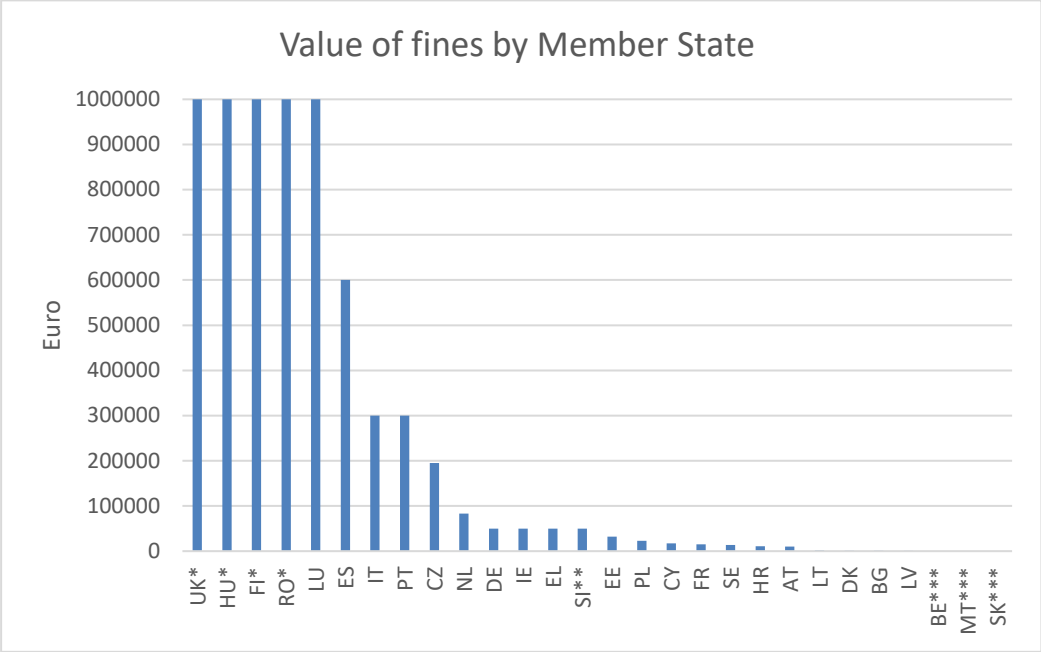


***** No limits on prison sentences i.e. judges can determine the length of the sentence.
** Data based on previous Commission survey data
*** No data received.

As shown above, several countries have not set prison sentences for the illegal sale of F4 pyrotechnics to the public, and clearly there is variation in the length of the maximum sentences set.

Some countries have chosen to issue fines for the non-compliant sale of F4 pyrotechnics, the maximum values for which are indicated in Figure 4.8. Where administrative law has been used only, fines are typically the only type of penalty that can be issued, however, where criminal law has been used, it may be possible to issue fines as well as prison sentences.

Figure 4.8: Comparison of the maximum fines that can be issued by Member Sate



* No limits on fine sizes. For FI and RO the authorities did not confirm the max limit.
** Data based on previous Commission survey data
*** No data received.

Again, there is some variation in the value of the fines that can be issued per country. As a recommendation, it could be suggested that some Member States should review their penalties so that they are aligned with those that could be considered as being more dissuasive.

Moreover, by comparing the types of maximum prison sentences (see Figure 4.7) that can be issued, and the country locations of the non-compliant companies identified (see Chapter 2), there seems to be mixed evidence for the correlation between the severity of the penalties and the number of companies that sell F4 pyrotechnics without specialist knowledge controls.

On the one hand, Czechia, Lithuania and Slovakia do not impose prison sentences for the non-compliant sale of F4 pyrotechnics while collectively having several non-compliant traders on their home market.

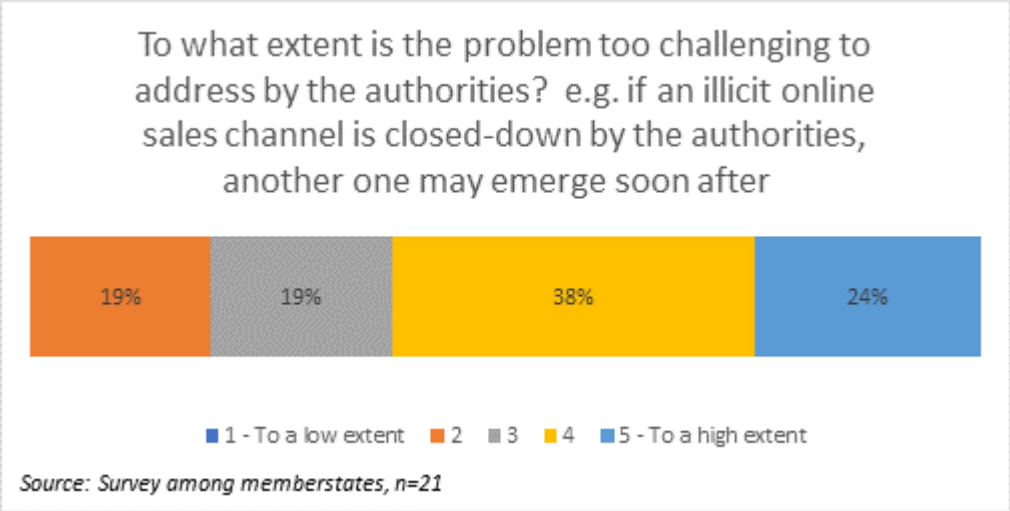
Whereas, countries like Bulgaria, Luxembourg and the Netherlands are home to companies that sell F4 products without specialist knowledge controls even though their maximum penalties are comparatively more severe.

Thus, as an observation, it seems while prison sentences can act as a deterrent, consistent monitoring of the market place and inspections are also required to ensure compliance with the law.

4.9. To what extent is the problem too challenging to address by the authorities

Given the possible difficulties in policing the non-compliant sale of F4 pyrotechnics online, we asked whether the problem is too challenging to address for the authorities, see Figure 4.9.

Figure 4.9: To what extent is the problem too challenging to address by the authorities?



As indicated in Figure 4.9, stakeholders generally perceived that there are significant challenges in tackling the problem.

The qualitative feedback provided some further insights on this matter. For example, in some cases, it was considered that there was a lack of legal powers for authorities in their home country to search for fireworks sold illegally.

In other cases, while national powers existed to search for fireworks sold illegally, the problems around cross-border enforcement meant that it was difficult to prevent intra-EU imports of F4 pyrotechnics sold to non-authorised persons.

Other points were made that there were adequate national control and licensing systems established to prevent the illegal sale of F4 pyrotechnics to the general public. However, when cross checked against the mapping results (see Chapter 2), some of these statements were provided by countries that were home to non-compliant traders. Clearly, even where strong national enforcement mechanisms exist, the online sale of (F4) pyrotechnics sold illegally is difficult to detect.

As alluded to by the online survey question, it was confirmed that repeat offenders, both large scale OCGs and small-scale intermediaries that sell F4 pyrotechnics illegally, were also known to the authorities.

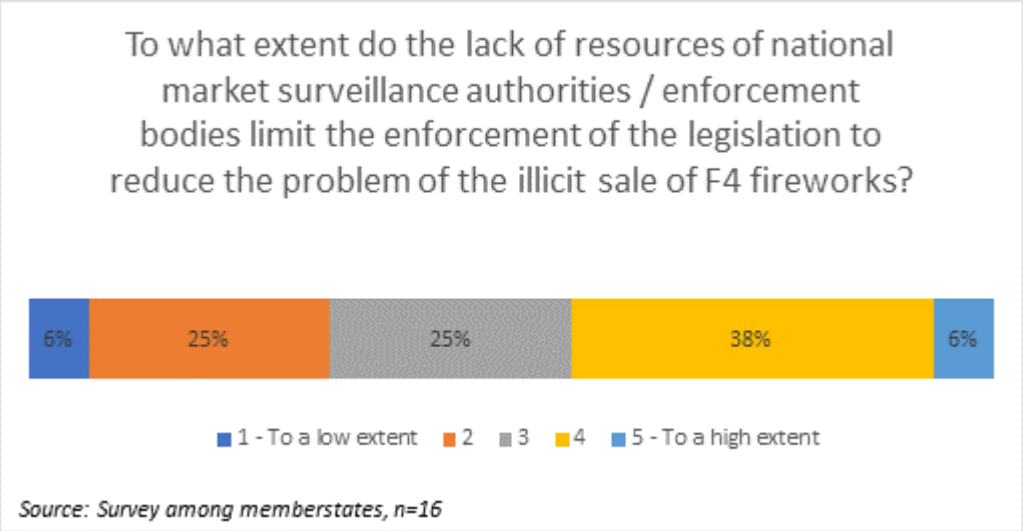
Moreover, it was mentioned that there may be a possibility of F4 pyrotechnics being sold by third country online stores to the general public, which presents clear enforcement challenges.[79]

4.10. To what extent is the lack of resources a problem for enforcement authorities

Considering that enforcement is a resource intensive activity, the online survey enquired whether the necessary resources were available to help reduce the problem, please see Figure 4.10.

[79] The examination of such websites was outside of the scope of the mapping activity as indicated in Chapter 2 and therefore it was not possible to research these claims.

Figure 4.10: To what extent is the lack of resources for law enforcement a problem?



As indicated in Figure 4.10, the online survey responses collected indicated that there were a range of opinions on the matter, although it does seem that access to resources for enforcement purposes presents a moderate to high problem to the relevant authorities.

The qualitative feedback provided some insight into this issue. Several opinions suggested that sufficient national resources were available to perform seasonal inspections (of a sample) of licensed premises that sold F4 pyrotechnics. However, emphasis was placed on the fact that the supply of F4 pyrotechnics to the public was associated with online stores operating in other Member States therefore national inspections may not address the problem directly. Therefore, the problem was not one of national resources, but lack of means to support cross border enforcement efforts.

In a small number of other cases, the explanations provided did not emphasise that national inspections were being undertaken. Instead, enforcement activities related to investments in public awareness campaigns that explain the law to the public only. Other countries mentioned that there was a lack of resources to monitor the online shops.

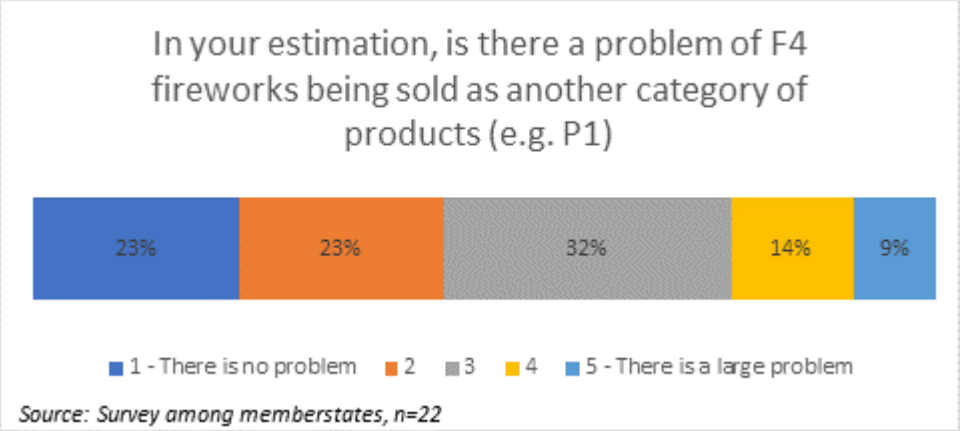
Considering the type of feedback provided, it should be stressed that Member States have to abide to the legal requirement to facilitate cross-border enforcement, in line with Art. 24 of Regulation (EC) No 765/2008 (to which the Pyrotechnics Directive refers).

Moreover, the AdCo Group for Pyrotechnics and Europol provide possibilities for national authorities to pursue cross-border enforcement actions, and the online shops are likely to have a physical presence meaning that they should be subject to inspections already.

4.11. To what extent is there a problem of F4 pyrotechnics being sold as another category of products?

A further issue explored was the issue of whether there was a problem of F4 pyrotechnics being sold as another category of products, please see Figure 4.11.

Figure 4.11: To what extent is there a problem of F4 pyrotechnics being sold as another category of products?



As indicated in Figure 4.11, the online survey feedback suggested that there was a moderate problem in this respect.

Some of the qualitative feedback illustrated that there has been a problem in the past with the mis-categorisation of F4 pyrotechnics as T2 or P2 (that require specialist knowledge for handling and use), although to a much greater extent as P1 (specialist knowledge is not required for P1).

Some types of flash bangers exceed the sound limited for the F3 category and therefore have been miscategorised in the past as P1, meaning that it was possible to sell the articles to the general public. These were typically Chinese fireworks that were brought-in to the EU by Belgian, Czech and Polish importers and certified by some European Notified Bodies.

It was also alleged that when testing the products, the European Notified Bodies recruited were following the instructions of the importers to certify the articles as P1 or P2 even if they were aware that the same articles were previously certified as F4 or F3.

It was suggested that the Notified Bodies recruited did not consider it as their legal responsibility to determine the intended purpose of the articles tested. This issue has been discussed already in the Notified Bodies Forum for Pyrotechnic Articles and a guidance statement has been issued on the matter after the meeting of 2017 and 2018.[80] While such allegations continue, in light of the current agreements in the Notified Bodies Forum, it has not been possible to substantiate if the guidance statement is not being followed.

4.12. Conclusions and recommendations

Conclusions

- The Directive is product-focused, and has been designed to enable the free movement of pyrotechnic articles in the internal market, on the basis of mandatory essential safety requirements for these products and a harmonised system of controlling that such requirements are met as a pre-condition for making them available on the EU market;

- While the Directive does not permit the (cross-border) sale and use of F4 pyrotechnics to the general public, it has not been designed in a way to restrict cross-border crime. For example, although the Directive mandates that users of F4

[80] Notified Bodies have already agreed on a guidance statement in relation to this issue. Please see resolution No 24 in the following document: https://ec.europa.eu/docsroom/documents/29483

pyrotechnics must have the necessary specialist knowledge, the different national requirements and documentary evidence related to these qualifications makes it difficult for economic operators and authorities to conduct checks of professionals that have obtained their specialist knowledge from another Member State;

- Cross-border cooperation to tackle the problem was said to be difficult although improving. Obstacles include difficulty to identify relevant counterparts in police authorities in other Member States that are open to following-up on case investigations and the sometimes limited extent to which police authorities consider the illicit sale and use of F4 pyrotechnics as a serious problem;

- There appears to be an uneven enforcement of the Directive with many complaints received that large amounts of F4 pyrotechnics have been sold online and transported from Czechia and Poland illegally to other Member States; the mapping activity (see Chapter 2) identified further non-compliant traders in Bulgaria, Greece, Lithuania, Luxembourg, Netherlands, Slovakia and Romania;

- Although there have been problems documented in the past, while there is no hard evidence to suggest that the Notified Bodies are not following the agreements made in the Notified Bodies Forum, reports were received that there is a "compliance gap" in the way in which some European Notified Bodies are certifying articles as Categories P1 or P2 as instructed by some European importers of Chinese pyrotechnics; in these cases, these types of categorisations do not reflect the intended use of the articles;

Recommendations

- The review of the national penalties indicated that there is wide variation in the types of maximum prison sentences and fines set. Where the maximum national penalties are not very stringent, these could be reviewed considering the types of comparatively stronger maximum penalties established in other Member States;

- Notified Bodies shall ensure a correct categorisation of pyrotechnic articles in line with their intended use. Furthermore, checks should be carried out by market surveillance authorities to determine whether the products are placed on the market according to the correct intended use (e.g. if a pyrotechnic article is certified as a P1 article, it cannot be marketed as a firework).[81]

[81] Article 6(1): Pyrotechnic articles shall be categorised by the manufacturer according to their type of use, or their purpose and level of hazard, including their noise level. **The notified bodies** referred to in Article 21 **shall confirm the categorisation** as part of the conformity assessment procedures referred to in Article 17

5. ASSESSMENT OF THE NEGATIVE (COST) IMPACTS CAUSED BY THE ILLEGAL USE OF F4 PYROTECHNICS IN THE EU

This Chapter provides details on the cost impact of the non-compliant sale and use of F4 pyrotechnics.

5.1. The negative cost impact pathway

Criminal activities result in a wide range of negative costs for society. In the context of this study, these costs can be considered as materialising as part of a business to consumer pathway from the non-compliant sale, to the non-compliant transit, and finally, to the non-authorised use of F4 pyrotechnics.

While the costs incurred along this pathway include those directly engaged in the non-compliant supply and use of F4 pyrotechnics, many of the costs identified can be considered as "externalities", defined as costs incurred by third parties as result of economic transactions between two other parties.

In this case, the negative cost impacts are imposed on the legitimate pyrotechnics industry, the public sector, tax payers, the distribution industry and innocent bystanders.

Table 5.1. provides a summary overview of this negative cost impact pathway informed by an analysis of the qualitative feedback.

Table 5.1: Negative cost impact pathway

Pathway step	Category	Types of resulting negative cost impacts
1. Costs resulting from the non-compliant retailer practices	*Non-compliance with tax law:* The recent case in Poland provided evidence that the illicit web-shops are involved in tax evasion and money laundering, resulting in a loss of tax revenues for the public sector.	• Loss of income to tax authorities and the public sector • Unfair competition with the pyrotechnics sector
	Non-compliance with national pyrotechnics requirements: The recent case in Poland indicated that the web-shops were non-compliant with national legal requirements on fireworks storage. Illegal manufacturing does not meet national safety standards.	• Unfair competition with the pyrotechnics businesses that have invested in complying with the national legislation. • The illicit companies are exposed to risks, including themselves, their own property and others.
	Selling F4 pyrotechnics online illegally: Selling F4 pyrotechnics online to the general public by themselves and in combination with other types of fireworks and products.	• Profit is generated on F4 pyrotechnics unfairly that is not possible to generate for other pyrotechnics retailers that comply with the law. • By selling F4 products online in combination with other (pyrotechnics) products the non-compliant traders market themselves as "one stop shops" to consumers, taking potential business away from companies operating legally.
2**. Costs resulting from the illegal transit of F4 pyrotechnics**	*Hiring of non-certified postal and courier companies:* Non-compliant traders hire courier firms that do not meet ADR standards to transit the goods to other Member States	• There is a loss of business to courier firms that are certified to carry fireworks; • Non-certified courier and postal companies are exposed to risks around damage to health and property;

Pathway step	Category	Types of resulting negative cost impacts
		• Courier firms must finance their own surveillance activities and participate in inspections by national authorities.
3. **Costs resulting from the non-authorised use of F4 pyrotechnics**	*Accidents caused by the misuse of F4 pyrotechnics*. Use of F4 pyrotechnics results in accidents to persons and = intentional and unintentional damage to property.	• Accidents to the non-authorised users and innocent bystanders resulting in personal health costs and time off from employers causing loss of earnings. In many cases, accidents even result in permanent injuries, disabilities, loss of jobs, psychological distress and further associated expenses; • The health services and health insurance companies need to pick-up the costs of treating those affected by accidents; • Vandalism results in damage to public and private property. • Insurance companies (or property owners) must pick up the costs resulting from damaged property.
	Loss of confidence in the public use of fireworks: Where accidents resulting from illegal use are reported, the wider public are discouraged from the safe use of fireworks resulting in loss of demand and further regulation of the pyrotechnics sector e.g. bans, restrictions etc.	• The pyrotechnics sector is subject to regulation that will result in further loss of business and unlikely tackle the problem of non-compliant traders and users. • Some consumers avoid purchasing fireworks given the heightened sense of risks;
	Enforcement costs incurred by authorities: Non-authorised use of F4 pyrotechnics purchased from other Member States results in an increased need to invest resource on national enforcement activities	• Police resources are used on searching individuals and premises, transporting confiscated F4 pyrotechnics using methods compliant with the ADR, storing fireworks in line with national requirements, examining the properties of the pyrotechnics confiscated to collate evidence, destroying the pyrotechnics in line with national requirements and producing records to ensure that these procedures are transparent to others.
	Criminal activities A small amount of criminal activity results in costs to persons and property from the non-authorised use of F4s	• F4 flash powder has been used to blow-up ATM machines; • Criminals have used F4 pyrotechnics as weapons during physical disputes.

While it has not been the purpose of the study to quantify the financial impacts resulting from the "negative cost impact pathway" described above, we have gathered evidence to help illuminate how some of these costs have materialised in some Member States.

5.2. Costs resulting from the non-compliant retailer practices and illegal manufacturing of (F4) pyrotechnics

The non-compliant sale of F4 pyrotechnics has a negative cost impact on the legitimate pyrotechnics sector. Competitive advantages are obtained by the non-compliant retailers through profiteering on the sale of F4 pyrotechnics, avoiding other regulatory and administrative requirements such as obtaining national storage licenses, and tax avoidance

(as evidenced by the recent case in Poland). Tax revenues are therefore not collected on the commercial transactions and company revenues by the authorities.

Consumers may be attracted to non-compliant sites that market a wide range of products, including F4 pyrotechnics and other items which are legal for purchase, generating further revenue for the non-compliant traders.

Moreover, stakeholder feedback suggested that illegal pyrotechnics factories identified had resulted in a small number of fatal accidents relating to those producing the materials in AT and DK; these incidents also included extensive damage to buildings and other property, and expenditure of health and police services resources.

5.3. Costs resulting from the illegal transit of F4 pyrotechnics

In response to the increase in the illegal submission of unlabelled packages containing F4 pyrotechnics, the courier and postal company interviewees indicated that they have had to introduce measures to address the problem.

To begin, all companies interviewed had participated in previous, and had planned forthcoming, joint inspection activities with the relevant national authorities, lasting several hours per inspection and involving managerial and distribution centre processing personnel.

Furthermore, in addition, the companies perform their own internal checks that take place weekly or fortnightly. For example, one firm has dedicated two staff members to spend about 4 hours per week to perform spot checks to identify the packages in one of their national distribution centres. In addition to spot checks, another firm intermittently hires-in trained detection dogs to identify the problem packages. All companies had invested in training activities for staff informing them of the need to conduct inspections and enable them to identify the unlabelled packages.

The financial costs of introducing the measures were in the region of several thousand euros per company and there was no sign that the ongoing financing of measures would recede given that it was considered unlikely that the problem would disappear in the short term.

Even though no accidents were reported to date, the ongoing risk of an accident occurring was considered possible, resulting in further potential health costs to staff and damage to company property.

All companies mentioned that the costs incurred partly stemmed from a (cross-border) public authority enforcement gap. At the same time, comments were made by government officials that courier and postal companies receive anonymous packages willingly without performing any checks of the packages or of the sender IDs.

5.4. Previous research on the costs resulting from the non-authorised use of F4 pyrotechnics in the Netherlands

The costs of the misuse of F4 pyrotechnics have been well-documented in the Netherlands, which can be considered among the high non-authorised usage countries (see Chapter 3). An official Dutch government safety board (VeiligheidNL) has recently declared New Year's Eve a safety hazard given the inappropriate use of legal and illegal fireworks by members of the general public.

In an official report published in 2018, it was indicated that in the Netherlands 434 persons were submitted to hospital emergency units for fireworks injuries on 31st December 2017, with 22% of the accidents related to the non-authorised use of F4 and F3 pyrotechnics both of which should be used by the general public in this Member State. Mostly, those injured were young adults and children. The cost of their hospital treatment considering

the length of stay in hospital and types of treatments received was estimated at 1.5 million EUR. Approximately, a further 700 persons were seen by general practitioners for less serious fireworks injuries in the same period.[82]

The same Dutch safety board (VeiligheidNL) conducted a follow-up study in 2018 on the persons injured by the fireworks described above. It was noted that 42% of the accidents associated with the New Year celebrations related to persons that had not ignited the fireworks themselves, 86% of those injured incurred burns and 72% eye injuries. Moreover, the roughly one quarter of cases associated with the misuse of F3 and F4 pyrotechnics incurred the most severe injuries, with 10% receiving amputations typically of (part of) fingers and hands.[83]

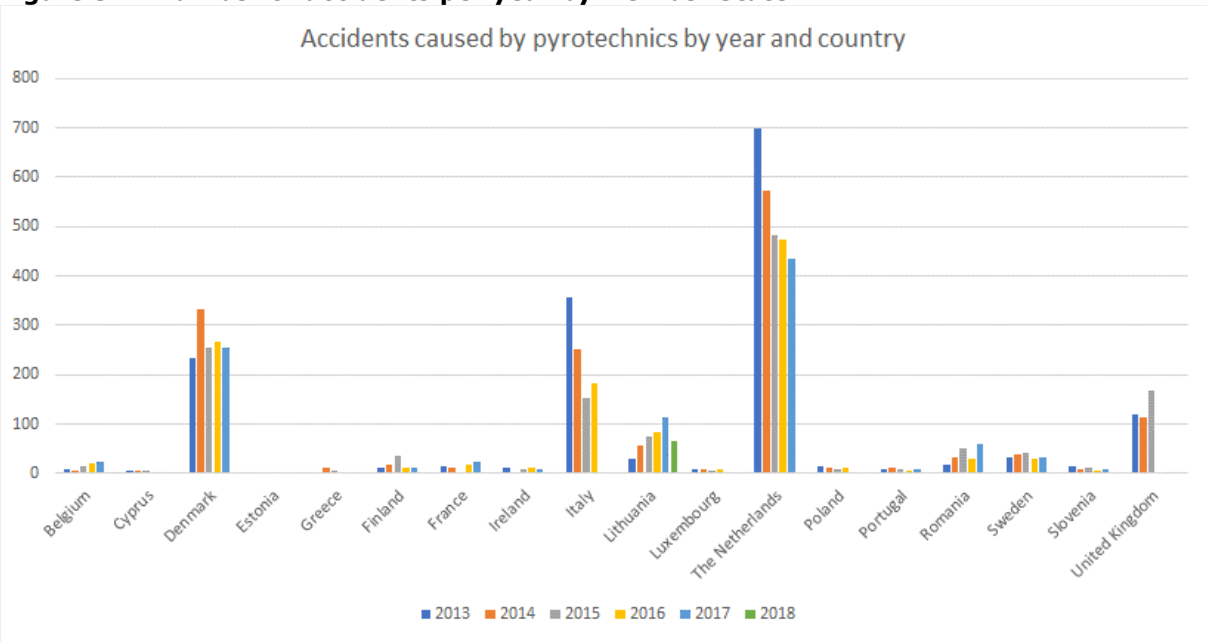
5.5. The number of accidents due to the use of pyrotechnics recorded by Member States

Periodically, the Commission collects data from the Member States on the number of annual accidents due to the use of pyrotechnics by the general public.

However, the data collected should not be considered as comparable, for example, considering that there are differences in the way in which accidents are defined (for example, some data-sets only report very serious accidents or fatalities while others report all types of pyrotechnic accidents); there are also likely to be differences in the data collection methods used. In addition, there is no reporting on whether the accidents were due to the non-authorised use of F4 pyrotechnics. Moreover, the data extends to 18 Member States only and does not include a number of large Member States such as France, Germany and Spain.

While the data should be treated with caution when viewed comparatively, we have collated the data and produced an analysis of the distribution of the annual number of accidents from 2013 to 2018 across the EU, please see Figure 5.1.

Figure 5.1: Number of accidents per year by Member State



*Information was not available for all years by Member State. Some Member States did not provide data. Estonia has only indicated 2 accidents for 2017 and due to this very low number, a visible bar was not produced.

While it is not possible to determine whether any of these 6566 accidents from 2013 to 2018 were the result of the non-authorised use of F4 pyrotechnics, there is clearly a

[82] VeiligheidNL (2018) Accidents with fireworks
[83] VeiligheidNLVeiligheid (2018) Type of fireworks and injury: fireworks accidents 2017-2018

significant cost for the public sector in treating injured members of the public as a result of poor pyrotechnics usage.

However, there seems to be some correspondence between some of the countries reported to have experienced non-authorised use of F4 pyrotechnics and the location of the accidents indicated in Figure 5.1., e.g. Denmark, Italy, Netherlands, and Sweden.

While it is clearly difficult to speculate the health care costs relating to these accidents for multiple reasons, based on the findings of the previous VeiligheidNL study, it could be estimated that the sum to finance the treatment of the 6566 injured persons was in the region of 23 million EUR.[84]

5.6. The number of accidents due to the use of pyrotechnics reported in the European Injury Database

With the assistance the European Association for Injury Prevention and Safety Promotion (EuroSafe), the study also performed an analysis of fireworks accident data available in the European Injury Database.[85][86] [87]

During 2008-2016, a sample of hospitals in 19 countries (18 EU member states and Turkey) submitted data to the database, although there are some gaps in the data-set as the number of countries providing data have decreased over time with 8 countries providing data in 2016. In total, the database contains about 2.87 million accident cases, which is an average of about 319,000 cases per year.

A query was submitted to the database to gather details of the number of accidents relating to pyrotechnics over the 2008-2016 period. In total, based on the sample of hospitals, 1396 accidents were reported which represented 0.0487% of all cases.

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[84] The previous Dutch study noted that 434 persons were treated for pyrotechnics injuries at a cost of 1.5 million EUR which equals €3546.3 per person. Of course, the value of the health costs will vary per country according to the extent of the national health costs and distribution of accident types.

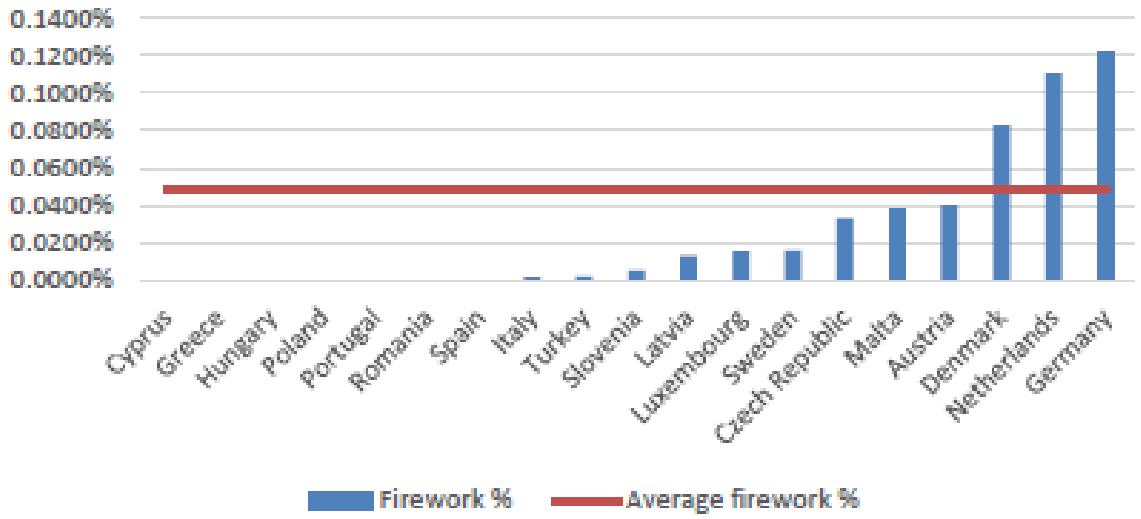
[85]More information on the European Injury Database can be found here: https://ec.europa.eu/health/indicators_data/idb_sv

[86] The EU IDB is an injury surveillance system based on accident & emergency department data from selected hospitals in various EU member states. The EU-IDB methodology is comprehensively laid down in the IDB-Manual [1]. Countries report on cases of acute physical injuries attending emergency departments (EDs) for diagnosis or treatment. Attendances relating to disease complaints or due to complications of medical/surgical care are excluded. Attendances for follow up treatment are not recorded as new cases. IDB covers all injuries i.e. unintentional injuries ("accidents") as well as intentional injuries (assaults and deliberate self-harm) and those of undetermined intent. The EU IDB consists of two different data-sets: The Full Data Set (IDB-FDS) and the Minimum Data Set (IDB-MDS). IDB-FDS was developed in the 90ies with a focus on external circumstances (potential risk factors) as activities, settings and (consumer) products involved in accidental home and leisure injuries. The main aim was and still is to serve national and EU-level product safety administrations.

[87] In the previous years, the IDB-FDS data collection was neglected to a certain extent; the number of IDB-FDS recording countries and hospitals decreased and the representativeness of IDB-FDS samples slightly deteriorated. Since IDB data comprises hospital treated injuries out of a sample of hospitals in each of the participating countries, data limitations and biases due to different national sampling methods, coding practices, or differences in hospitalisation practices across Member States do occur. Nonetheless the IDB-FDS is the only data source in the European Union that contains harmonized cross-national data on injury mechanisms, involved settings, activities, products or services – details which can be analysed in relation to type and severity of the actual injury for each record.

To ensure the sample of data obtained for the database could be interpreted meaningfully, percentage figures were produced by Member State, see Figure 5.2.

Figure 5.2: Percentage of pyrotechnics accidents per country as reported in the IDB database



As Figure 5.2. shows, based on the sample of hospital data in the Member States for the period 2008 to 2016, the overall percentage of accidents relating to pyrotechnics is quite small per country, with an above average share reported in Denmark, Germany and the Netherlands.

So that the sample of data contained in the IDB database can be used to formulate EU-level estimates, Eurosafe has established a methodology that considers the proportion of accident types (such as fireworks) in the context of the overall estimated number of emergency department treatment cases for the EU in the 2013 to 2015 period.[88] [89]

By applying this existing methodology, and using the sample from the IDB database for the 2013 to 2015 period (i.e. about 139 fireworks cases per year), it was estimated that for the EU Member States, about 16,000 fireworks accidents occur each year.[90] It should be noted that this estimate does not include treatments provided by primary health care facilities.

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[88] The average annual IDB-MDS incidence rate (just EU member states) is 7.487%, which means that in the EU-28 annually it is estimated that about 5.0 million inhabitants get admitted to inpatient care due to an injury, and additional about 33.1 million inhabitants need ambulatory treatment in emergency departments of hospitals, which is a total of 38.1 million Emergence Department-treatments.

[89] Eurosafe (2017): Injuries in the European Union 2013-2015 – Supplementary report to the 6th edition on IDB data flow, country comparison and ECHI-injury indicators 2013-2015. At: http://www.eurosafe.eu.com/uploads/inline-files/IDB%202013-2015_suppl%20to%206th%20edition%20Injuries%20in%20the%20EU.pdf

[90] It needs to be pointed out that this projection is a suggested estimate only. For example, there are almost no IDB data from big European countries like France and Poland; the figures for Germany stem from just one hospital and might be biased. The sample of IDB reference hospitals is not validated at EU-level and only the samples of rather small countries Austria, Netherlands, Latvia, Malta, Luxembourg, Slovenia and Sweden can be considered as sufficiently representative, according to the delivered metadata. Since the EU IDB sample is not a true random sample, no confidence intervals for the estimate can be ascertained.

Considering that the European Injury Database contains information on the number of days of care provided per accident case, Eurosafe provided a rough estimate of the hospital bed-day costs (this does not include ambulatory treatments, rehabilitation, medication etc).[91] For the period 2013 to 2015, it was estimated that the annual cost of care was in the region 10 million EUR per year.

In terms of the characteristics of the victims, unfortunately most (53%) were children and young adults from the ages of 10 to 24 years old.

Most injuries require ambulatory treatment only (78%). However, 22% of the patients received hospital care and 0.3% of injuries resulted in fatalities.[92]

5.7. Other anecdotal evidence relating to non-authorised use of F4 pyrotechnics

Stakeholders were invited to provide anecdotal evidence of any negative cost impacts associated with the non-authorised use of F4 pyrotechnics, examples included:

- *Use of police resources*
    - The authorities are required to deal with many cases associated with the non-authorised use of F4 pyrotechnics (Austria);
    - Extensive resources have been invested by the Netherlands on national and cross-border enforcement actions e.g. the recent Poland case took 3 years of evidence collation and coordination with authorities in other Member States involving three officials; the overall time spent was estimated at one year of labour time for one person plus the work of local police gathering information from non-authorised users;
    - Several cases involving OCGs have been dealt with by the legal system(Netherlands);
    - An investigation into an OCG in Germany resulted in approximately 1000 properties being searched;
    - The recent Polish case (as explained in Chapter 2) resulted in 100 premises being searched in one day;

- *Severe injuries*
    - In recent years, a member of the public lost one of their hands by mistakenly considering it safe to ignite an F4 flash banger while holding it (Austria);
    - The main cost is to the health services due to lost fingers and facial injuries (Czechia);

[91] 300 patients of all 1396 (21.5%) were treated as inpatients (241 were admitted to the same hospital, 55 transferred to another hospital and four deceased). For 229 of the inpatients (76%) the number of days of hospital care is known: In total these 229 patients needed 1240 days of inpatient care. If you assume that the remaining 24% (for which the hospital days are unknown) had the same care needs, the entire IDB-FDS sample consumed 1632 hospital days. The sample ration 1396/15866 is 8.80% and the according extrapolation factor 11.37 (based on the EU member states data 2013-2015). Applying this factor leads to estimated 18.666 – rounded 19.000 – days of inpatient care for all firework injury patients in the EU every year. The costs of one average bed-day in the EU can be roughly estimated from data from Eurostat, by combining the number of bed-days and reported health care costs for inpatient treatments. Based on the data 2014-2016 one average EU bed-day costs about EUR 532. This means costs of roughly EUR 10 million per year for the treatment of inpatients due to firework injuries. The entire health care costs, including ambulatory treatments, rehabilitation, medication etc. are at least double as high.

[92] The hospitalization percentage of 22% is significantly higher than the average of all home and leisure injuries (5%) indicated by the IDB database which indicates that firework-related injuries are more severe than other home- and leisure accidents.

- All although there are no available data, severe injuries incurred by pyrotechnics users and bystanders are known at New Year's Eve (Germany);
- Severe accidents and a small number of fatalities at New Year's Eve have been reported (Denmark)
- There were 216 injuries and 44 severe injuries due to poor pyrotechnics usage on New Year's Eve 2018 (the Netherlands);
- Although there are hardly any cases of non-authorised use of F4 pyrotechnics known to the authorities, in 2015, in Latvia, there was one fatality;
- Injuries due to F4 pyrotechnics being used as weapons by criminals (Sweden);
- Several severe accidents involving pyrotechnics were reported by the French authorities including the death of an unqualified person storing fireworks for a display show.[93]

- *Criminal damage*
  - F4 flash powder has been used to blow-up ATM machines (Austria, Netherlands);
  - Melted seats at football stadia cause by F4 roman candles have been reported (Denmark);
  - A phone booth has been destroyed by an act of F4 pyrotechnics vandalism (Luxembourg);
  - Damage to shops, dwellings, bus stops have been reported (Sweden);

- *Reputational damage to the legitimate pyrotechnics sector*
  - The general public are increasingly annoyed by the non-authorised use of F3 and F4 pyrotechnics at unlicensed events (Cyprus);
  - Persons are frightened by the non-authorised (violent) use of pyrotechnics (Sweden);

5.8. Conclusions

- The non-compliant sale and use of F4 pyrotechnics has resulted in a wide range of negative cost impacts. This includes costs incurred by those that sell and use the pyrotechnics illegally, and also by third parties such as the public sector, innocent bystanders, insurance companies, postal and courier companies, property owners, the legitimate pyrotechnics sector etc.;

- Although the data is incomplete, 18 Member States have reported 6566 pyrotechnics accidents to the Commission over the last five years. Some of the accidents have been reported in countries where it is recognised that there are problems with the non-compliant use of F4 fireworks (e.g. Cyprus, Denmark, Netherlands, Italy, Sweden). It is notable that many large Member States are not included in this sample, such as France, Germany, Spain and therefore the numbers provided only give a partial assessment of the trends.

- The analysis of the IDB database performed by Eurosafe provides further insights into the frequency of pyrotechnics accidents. Although issues with the representativeness of the sample were detected, it was suggested that 16,000 pyrotechnics accidents occur each year across the EU Member States, at an estimated hospital cost of 10 million EUR per year, with just over half of the victims being children and young adults;

- A wide range of negative cost impacts resulting from the non-compliant activities have been reported including loss of business and reputational damage to the

[93] https://www.aria.developpement-durable.gouv.fr/accident/51825/

legitimate pyrotechnics sector, health services costs, policing costs, judicial system costs, vandalism, severe personal injuries, fatalities, damage to property etc.

6. MULTICRITERIA ANALYSIS OF THE POLICY OPTIONS

This Chapter provides the results of a multicriteria analysis of potential Policy Options that could be considered as part of possible future policy reform and implementation initiatives; the analysis was informed by feedback collected via the interviews and survey.

The material has been assessed subsequently from a multicriteria perspective and analysed based on an assessment of the existing context (see the previous Chapters). The Policy Option analysis gives a clear indication of the most effective and acceptable ways to move forward to limit the non-compliant sale and use of F4 fireworks by the general public.

The most significant challenge identified is the non-compliant online sale and purchase of F4 pyrotechnics from one Member State to another. As described below, the most appropriate response to this problem is the better enforcement of the existing rules and the improved cooperation between the relevant Member State authorities.

This response should be complemented by other measures to enhance the enforcement activities, including a harmonised form demonstrating the authorisation of specialist knowledge persons supplemented by, in some countries, stricter penalties.

The Directive could also be made more flexible to allow Member States to introduce restrictions around the possession, sale and use and F4 pyrotechnics, as is the case for F2, F3, and theatrical pyrotechnic articles.[94] Possibly, this proposed amendment of the Directive could enable the Member States to ban the online sale of F4 pyrotechnics.

6.1. Approach to the multicriteria analysis

Via the survey and interviews, the respondents were asked to assess a range of suggested Policy Options that could assist in addressing the illegal sale and use of F4 fireworks. Using this data, a multicriteria analysis was performed to examine the relative merits of these Policy Options. The Policy Options reviewed included:

- **Policy Option 0:** Continuation of the status quo;
- **Policy Option 1:** Stronger enforcement of the existing rules (e.g. introduction of guidance to better comply with and implement the rules, better EU-wide cooperation and enforcement etc.);
- **Policy Option 2:** Revision to the Directive (e.g. introduction of a harmonised EU form for the mandatory identification of persons with specialist knowledge, solely for the purpose of purchasing restricted pyrotechnic articles, and providing the possibility to allow Member States to introduce restrictions on the possession, sale and use of F4 pyrotechnics);
- **Policy Option 3:** Revision of the harmonised standard series EN 16261, part 2 (e.g. by introducing a maximum net explosive content (NEC) for certain types of F4 pyrotechnics);
- **Policy Option 4:** Reform to national legislation (e.g. stronger national penalties for the illicit sale and misuse of F4 pyrotechnics).

The multicriteria analysis assessed the above Policy Options against a series of objectives and criteria to reach a conclusion on which options, or combination of options, could be potentially suggested as best reducing the problem of the illegal sale and use of F4 pyrotechnics. The results of the multicriteria analysis are indicated in Table 6.1 with each

[94] This Directive shall not preclude measures taken by a Member State to prohibit or restrict the possession, use and/or the sale to the general public of category F2 and F3 fireworks, theatrical pyrotechnic articles and other pyrotechnic articles, which are justified on grounds of public order, security, health and safety, or environmental protection.

Policy Option ranked on a scale of 1 to 5 (5 meaning a high level of performance) against the criteria.

Table 6.1: Multicriteria analysis of the Policy Options

Objectives	Criteria	Do nothing	Better enforce-ment	Revision to the Directive	Revision to the standards	Revision of national legislation
Protection of human health, private property and public security	Minimise risks to persons, business and property	+	+++++	++	+	++
Only persons with specialist knowledge should handle F4 pyrotechnics	Reduce the number of non-compliant traders on the market	+	+++++	+++	+	++
Only persons with specialist knowledge should use F4 pyrotechnics	Reduce the number of non-authorised users	+	+++++	+++	+	++
	Reduce the number of accidents and damage to property	+	+++++	++	+	++
Limit the regulatory and administrative burdens and costs	Reduce the burdens and costs on the public sector	+++++	+	++	++	+++++
	Reduce the burdens and costs on SMEs and large firms	+++++	+++++	+++++	+	+++++

+++++ high level of performance in meeting the criteria
++/+ moderate level of performance
+ low level of performance

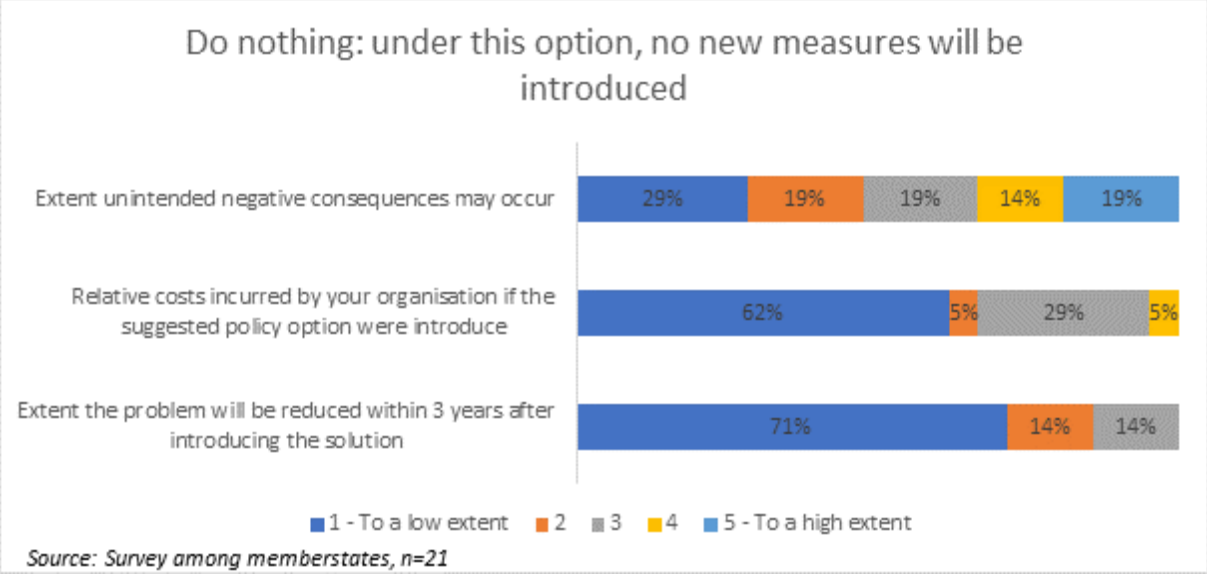
The rationale for the results provided in the table are further elaborated in the sections below. However, as Table 6.1 shows, there is an overall indication that stronger enforcement of the existing rules (Policy Option 1) would best address the issues identified, although this proposal would operate more effectively if it were complemented by a possible revision to the Directive to introduce a harmonised specialist knowledge forms (or by a harmonised specialist form introduced by a guidance recommendation) and providing the flexibility for Member States to introduce restrictions relating to F4s (Policy Option 2) and where needed, reforms to national legislation (Policy Option 4) to ensure that penalties are dissuasive.

6.2. Analysis of Policy Option 0: Continuation of the Status Quo

Policy Option 0 related to the continuation of the status quo, meaning that no further actions would be taken beyond those currently implemented.

The reaction to this suggestion was largely negative; most interviewees recognised that there were current failings in some Member States not meeting their obligations under the Directive as well as challenges for others in controlling the incoming F4 pyrotechnics caused purchased from other Member States. Faced with an anticipated increase in internet-based trade, the status quo option was seen as an unsustainable situation both for the near future and beyond. Therefore, the general feeling was that some form of action should be taken. This was a commonly supported viewpoint even in countries with very few recorded non-compliant activities. The online survey feedback to this Policy Option is indicated in Figure 6.1.

Figure 6.1: Stakeholder assessment of the potential impact of Policy Option 0



As indicated in Figure 6.1, although this option would not incur any further initial expenditure for the public sector, it should be noted that there are other negative ongoing costs incurred by society as indicated in Chapter 5. Therefore, it would beneficial for further public investments to be made to improve public safety and reduce the ongoing societal costs identified.

In addition, considering the expected increase in intra-EU internet transactions, it was considered doubtful that the problem would be solved via this option over the next 3 years, and therefore this option was not considered viable.

6.3. Analysis of Policy Option 1: Stronger enforcement of the existing rules

Policy Option 1, stronger enforcement of the existing rules, was recognised as the most appropriate method to address the problem. This Policy Option encourages actions that can be deployed without revising the Directive and relate to a combination of measure that could be taken at EU and Member State levels.

Clearly, Member States already have a legal mandate to ensure that F4 pyrotechnics are not supplied to the general public and are required to engage in cross-border efforts when requested and needed. However, due to the dynamics of the market, there is still room for improvement under the current legislation. This is partly due to the fact, that following the transposition of the Directive, appropriately designed national legislation and the implementation of practical solutions are in various stages of development across the Member States.

Cross-border and EU wide cooperation

The Directive provides some flexibility on how this is to be achieved, however, resources should be made available to engage in intelligence sharing procedures at European level,

and to conduct surveillance and investigative actions against non-compliant traders and users.

However, the interviews revealed that cross-border cooperation is not yet established at a satisfactory level, with obstacles including resources, lack of information to navigate enforcement systems in other countries and identify counterparts, limited powers, relations in the early stages of development, different priorities, etc.

While the Directive provides opportunities for cross-border enforcement, in practice these barriers restrict coordinated efforts. If unlabelled packages sent from one Member State are intercepted by the market surveillance in another Member State, the economic operator who has violated the Directive is in a country outside of their own jurisdiction. It is not possible for the market surveillance authority to select this operator for a control visit or engage in a proactive dialogue directly.

Instead, this task involves identifying the right counterpart authority and contact information, possible translation of documents and working in a non-native language, convincing the counterpart authority that the relevant case is important, developing a highly convincing evidence base representing a large number of unlabelled parcels seized, learning the other Member State's legal system and procedures, sustained communication, and so on. Pushing forward and coordinating such cases demands a relatively higher amount of resources compared to the other tasks facing the market surveillance and law enforcement authorities.

Policy actions and initiatives should therefore reduce the barriers to cross-border and EU-wide cooperation. In this context, new initiatives could be launched to strengthen efforts, such as guidance to Member States to indicate which counterpart authorities are designated to follow up cases and how authorities can fulfil their obligations under the Directive, methods to demonstrate evidence building, suggestions for easier sharing of information and cooperation on cases, and the establishment of a network to ease ongoing cooperation and support.

Importantly, the role of AdCo group on Pyrotechnic Articles in sharing information on enforcement efforts and the performance thereof should be strengthened. One suggestion is that market surveillance authorities should perform inspections of pyrotechnic retailers, so that sales data relating to F4 pyrotechnics can be examined to identify the qualifications of the persons that have purchased the articles. It is also advised that an AdCo online web-shop inspection task force and programme are established

As a suggestion, to avoid duplication of infrastructure costs, the use of already existing information sharing tools such as the Information and Communication System on Market Surveillance (ICSMS) could be promoted. The use of ICSMS forms part of the existing market surveillance activities and supports implementation of Art. 23 of the Regulation 765/2008 implying that its use is mandatory. However, without adaptation to the ICSMS system, its usefulness would be limited considering that it is designed to share information relating to non-compliant products.[95]

Thus, if properly adapted to share information on non-compliant web-shops, the ongoing use of the ICSMS would likely help build-up knowledge and interactions between relevant counterparts and make coordination more efficient.

Similarly, it could be explored whether the Coordinated market surveillance activities Programme in the EU (coordinated activities on consumer product safety) could be utilised

[95] However, authorities are often unaware that the use of the tool is mandatory. While the tool is under constant development and still lacks adaptations in order to be used efficiently in the field, it has been noted on multiple occasions that even current guidelines are not followed and existing functions are not being used. The tool is currently designed to deal with non-compliant products and lacks functions that would allow to signal non-compliant sales.

to support the recommendation to strengthen cross-border and national enforcement initiatives whether financially or otherwise.

Moreover, it would be important to strengthen the prioritisation of cross-border and national enforcement activities with the support of Europol and Eurojust to make use of their insights and resources.

National initiatives to strengthen enforcement

Under the current Directive, there is space for national variation in the organisation of the markets and selling of F4 pyrotechnics. All countries must have a market surveillance system in accordance with the Directive, but the exact requirements and procedures, allocated resources and the extent of the political prioritisation differ greatly. This is natural, given the different cultural practices around the regulation of pyrotechnics.

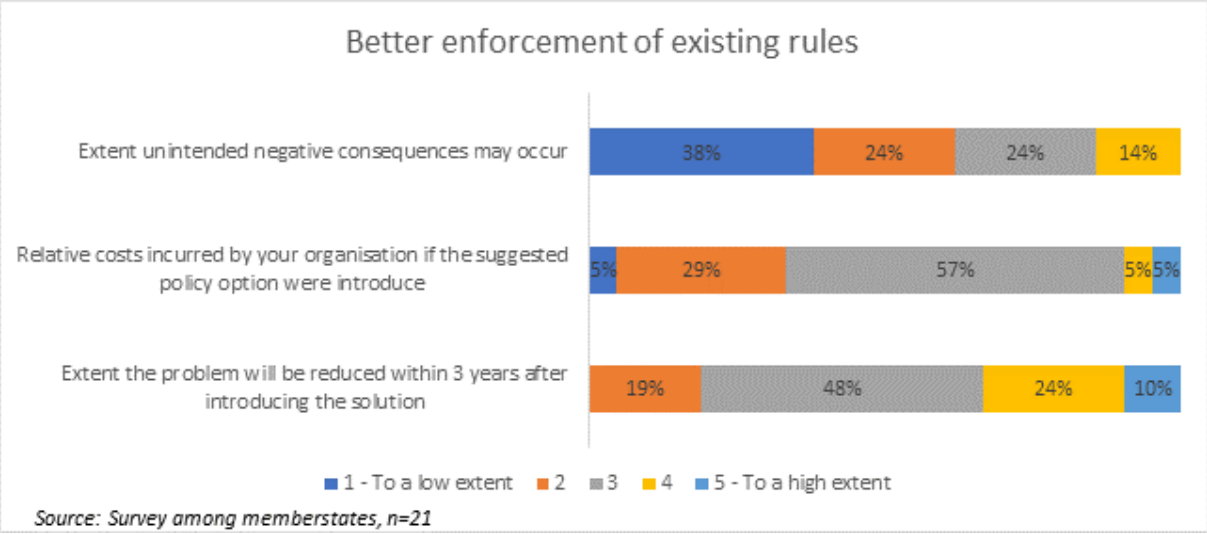
However, given the overlap of internet-based sales and the internal market, the existing variations in enforcement represent a possible weakness in the organisation of the current overall market surveillance framework.

Some countries are (without their awareness and sometimes without any significant domestic problems as known to the authorities) "suppliers" to other countries where the existence of sub-cultures associated with the non-authorised F4 pyrotechnics can exploit weaknesses in the existing market surveillance system by purchasing large volumes of such products online which are able to reach the homes of consumers in unlabelled parcels using courier and postal services.

For "receiving" countries, where non-authorised pyrotechnics use represents a substantial public safety risk, authorities are in the unfortunate position of not being able to limit the problem fully, despite their investment in significant control and judicial interventions.

In response, the stakeholder feedback points to a stepping-up of national market surveillance and law enforcement efforts, to ensure a harmonised implementation of the existing requirements mandated by the Directive. The objective would be to identify and remove non-authorised (online) sales of F4 pyrotechnics, with the issuing of penalties to those that have broken the law. Clearly, this would be achieved through the scaling-up of national approaches to market surveillance and law enforcement. The online survey feedback to this Policy Option is indicated in Figure 6.2.

Figure 6.2: Stakeholder assessment of the potential impact of Policy Option 1



As indicated in Figure 6.2, Policy Option 1 received the most positive response in terms of the extent to which the problem is expected to diminish in a 3-year period after its implementation.

Against all criteria listed in Table 6.1, it could be expected that under Policy Option 1 improvements could be made compared to the current situation in terms of improving public safety and protection of private property etc. The interviewee feedback suggested also that the results obtained would be more substantial than implementing any other Policy Option individually.

Under this option, there would clearly be a requirement for significant further investment by the public sector to scale-up efforts, particularly joint international investigations and national market surveillance and law enforcement efforts.

To give an indication of the human resource costs involved for just one case, for the previous case in Poland, the Dutch authority mentioned that the level of investment represented 1 year in labour time for one person shared between three officials.[96]

However, considering that there are extensive ongoing costs for the public sector and society around the non-authorised sale and use of F4 pyrotechnics (see Chapter 5), one would expect that if the problem were to diminish, a lower level of spending in enforcement activities could be realised over time along with a reduction in other negative cost impacts.

For example, the investment in additional enforcement costs also needs to be weighed against the range of other costs that are currently being incurred in the absence of even enforcement across the EU, such as the actions taken by courier companies to identify unlabelled packages containing F4 pyrotechnics, the hospital costs relating to the treatment of injuries caused by the misuse of F4 pyrotechnics, long-term disabilities, losses to insurance companies, damage to property etc.

6.4. Analysis of Policy Option 2: Revision to the Directive

Under Policy Option 2, it is proposed that a revision to the Directive is implemented that would lead e.g. to the issuing of a harmonised European form to demonstrate the specialist

[96] This time was spent investigating the results of enforcement activities of other bodies such as searches in the police databases, courier cases, and other sources to build-up a body of evidence. The Polish authorities also invested significant resources and among other things undertook 150 property searches in one day.

knowledge of professionals, for the sole purpose of facilitating their identification as authorised persons when they purchase restricted pyrotechnic articles in another Member State.

In addition, further revisions could be made to the Directive to permit Member States to introduce restrictions around the sale of F4 pyrotechnics as is already the case with other categories of pyrotechnics.[97]

Sub-option 1: Introduction of harmonised form

Realised through a revision to the Directive, a key aim of the harmonised form would be to provide clarity and certainty to the retailer that the buyer has obtained in one of the Member States the necessary credentials to qualify as a person who can legally handle and use F4 pyrotechnics in the Member State where the form was issued.

In theory, as it currently stands, an economic operator would need to be able to verify documentation issued by all Member States if it is their intention to supply F4 fireworks to professionals located across the internal market which lends itself to obvious challenges which a harmonised form would reduce significantly.

Moreover, considering the timeframe that is normally required to introduce reforms to EU legislation, the introduction of the harmonised forms could be implemented through an initial guidance document directed at the Member States prior to a legislative amendment of the Directive. This would have the advantage of testing the approach decided by the Member States and subsequently, if a vast majority of the Member States deems the approach useful and effective, could be subsequently strengthened or modified where needed through the Commission's proposal.

In addition, to permit monitoring and control activities, economic operators would be required to ask and keep in his/her records a copy of the form, that would be provided upon request to market surveillance authorities during controls and investigations.[98] This could be made possible in several ways:

1. Through an amendment to EU law;
2. At the discretion of the Member States, a revision to national legislation to accompany the single provisions on requirements for proof of specialist knowledge;
3. Via non-binding recommendations at EU level and if deemed appropriate, at national level as well.

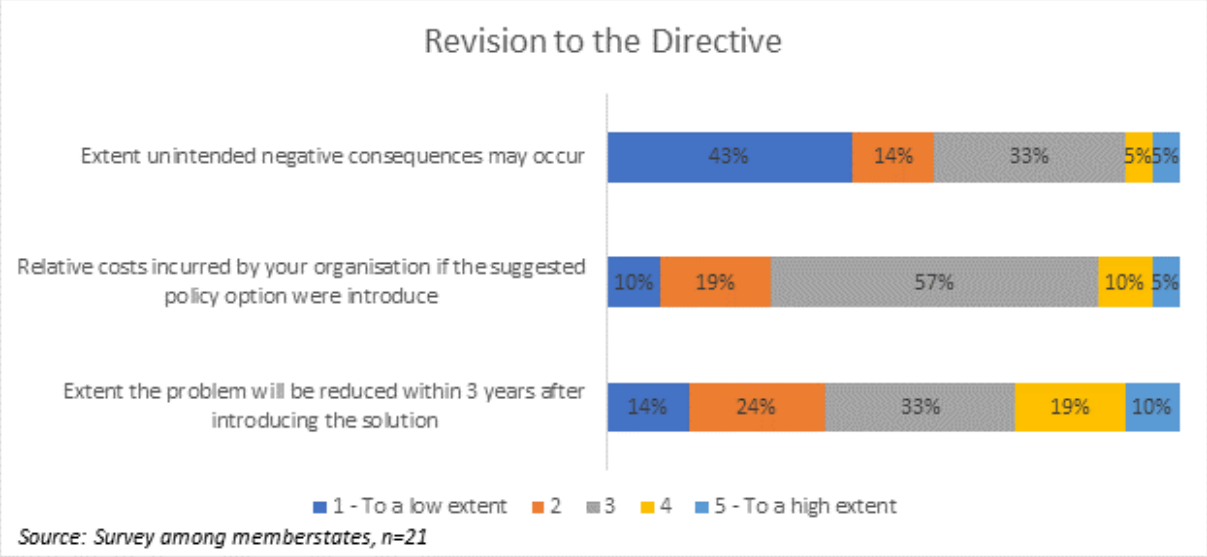
Reflecting on the above approaches, clearly, an amendment to EU law would likely bring about a more effective and consistent approach to ensuring that the relevant provisions of the Directive are met.

The online survey responses to this Policy Option are indicated in figure 6.3..

[97] This Directive shall not preclude measures taken by a Member State to prohibit or restrict the possession, use and/or the sale to the general public of category F2 and F3 fireworks, theatrical pyrotechnic articles and other pyrotechnic articles, which are justified on grounds of public order, security, health and safety, or environmental protection.

[98] It could be envisaged to amend the Pyrotechnics Directive by inserting a paragraph on the economic operator's duty to keep a copy of the harmonised form indicating the specialist knowledge of the person to whom they made available F4s.

Figure 6.3: Stakeholder assessment of the potential impact of Policy Option 2



Echoing the online survey results, the interview feedback suggested that the introduction of this Policy Option could have a moderate effect in addressing the problems identified although to a lower extent than Policy Option 1; please also see Table 6.1.

However, comments were made that this Policy Option was a useful complementary initiative that could strengthen the activities described under Policy Option 1. Clearly, the effectiveness of this policy action relies, of course, on the intention and actual efforts of the retailer to check the buyers' authorisation status. As we have shown in this report, the main problem is the absence of retailer controls, therefore, a harmonised approach to enforcement is needed most.

Other ways to revise the Directive (introduction of restrictions around F4 pyrotechnics)

In addition to the harmonised form, there are other relevant ways the Directive can be revised. Comments were made that the Directive could be made more flexible to allow Member States to introduce restrictions around the possession, sale and use and F4 pyrotechnics, as is the case for F2, F3, and theatrical pyrotechnic articles.

There were suggestions in the interviews that the Directive should be revised to allow Member States to restrict the selling of fireworks to physical locations only, in other words, a ban on remote and internet-based intra-EU trade. This solution is clearly justifiable given the severity of the injuries and damage that non-authorised F4 pyrotechnics use can cause.

Again, however, considering that some businesses were identified as highly committed to breaking the law to make a profit, under this scenario, harmonised enforcement efforts would still be required to prevent the non-compliant sale of F4 pyrotechnics online.

In conclusion, while it is recommended that the Commission should consider introducing such a reform, it should be interpreted as a complementary measure to be implemented in tandem with Policy Option 1.

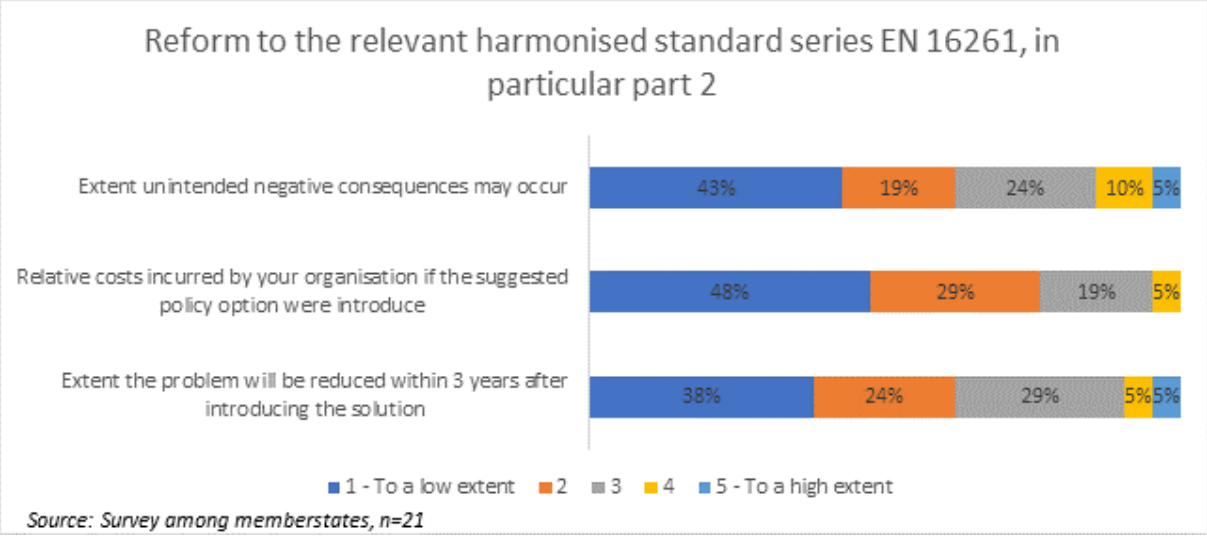
6.5. Analysis of Policy Option 3: Revision of the harmonised standards

Another Policy Option explored was a revision to the harmonised standards, for example by introducing a limit to the Net Explosive Content (NEC) that could be used for some F4 pyrotechnics.

However, this type of response was judged to be misguided by interviewees broadly speaking. The main reason was that the proposed Policy Option would not reduce the illegal behaviour of some business operators and users. Evidently, even if F4 pyrotechnics were made "safer" by reducing their explosive potential, they would still pose serious threats to the public and property if made available to non-authorised users.

Thus, analysis of the interview feedback indicated that this Policy Option would not perform well in successfully addressing the criteria indicated in Table 6.1. The online survey results are indicated in figure 6.4.

Figure 6.4: Stakeholder assessment of the potential impact of Policy Option 3



Compared to the other Policy Options, and similar to the interview feedback, the online survey results suggested that a reform to the harmonised standards would not be effective.

However, a very small number of interviewees mentioned that F4 pyrotechnics could be made "safer" if a limit to the Net Explosive Content was introduced. Despite this request, it is recommended that the future focus should be on measures that directly address the problem discussed i.e. the removal of non-compliant traders from the market and the issuing of penalties through better enforcement of the Directive.

In terms of the costs imposed, under this Policy Option, there would be some time and financial investment required in the standardisation process by industry and other stakeholders to revise the harmonised standards even if some Commission financing was made available, and a need for industry and notified bodies to buy and learn the new requirements, and adjust their manufacturing processes where needed. Although, after completion of these initial procedures, the overall ongoing costs would be negligible on the public and private sectors.

6.6. Analysis of Policy Option 4: Reform to national legislation

Policy Option 4 calls for national reforms to the maximum penalties relating to the offence of the non-compliant sale of F4 pyrotechnics to the general public to ensure that they are sufficiently dissuasive.

The types of maximum penalties set per Member State have been reviewed already in Chapter 4 and it can be observed that:

- Many countries have established prison sentences, but others have not as they have established the penalties in the context of national administrative law and not criminal law;

- Some of the maximum prison sentences set appeared to be comparatively short e.g. 3 years or less;

- Most countries have provided the possibility for the authorities and judiciary to issue fines, but some have not;

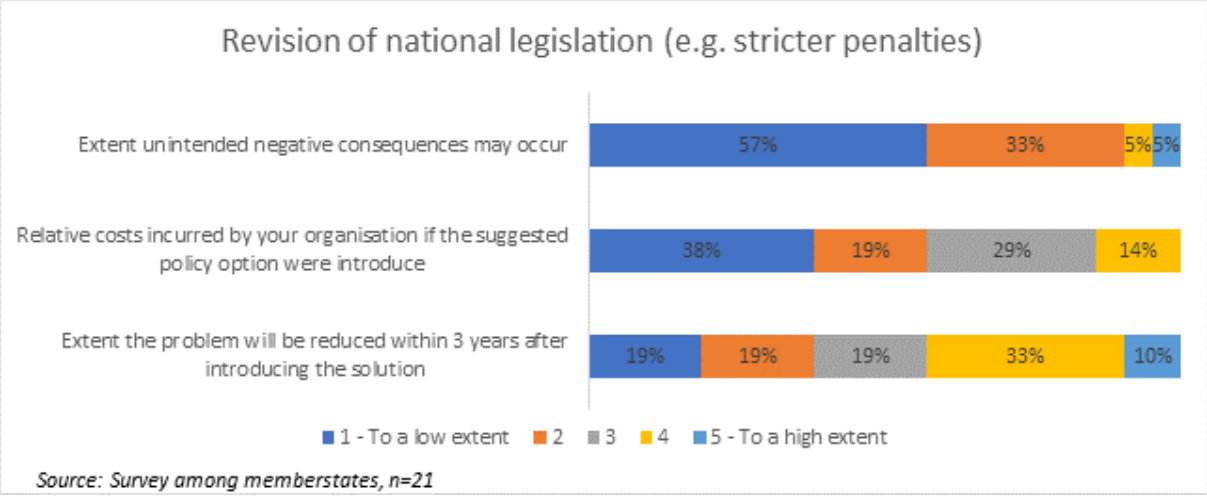
- Some of the ceilings for the maximum fines set appeared to be comparatively low e.g. less than 300,000 EUR.

While the advantage of the administrative approach is the ability for the authorities to impose fines quickly, the criminal law method typically is more stringent, more dissuasive and typically more thorough considering the need to review the evidence in detail prior to the issuing of criminal penalties including prison sentences.

Based on the interview feedback received, all countries supported this Policy Option but only one country suggested partially that their own penalties were not dissuasive. It would be helpful if the Member States could review their own positions to explore if stricter penalties could be introduced in view of the comparative examination.

However, there is a belief among the stakeholders that the penalties in other countries are not dissuasive. Although there is a case to make the penalties more stringent across many Member States even where no non-compliant retailers have been identified, this position seemed justifiable considering that it reflects the problem of non-compliant cross-border and internet-based intra-EU trade of F4 pyrotechnics originating from countries that have less stringent penalties. Figure 6.5 provides the results of the online survey to this Policy Option.

Figure 6.5: Stakeholder assessment of the potential impact of Policy Option 4



To help interpret the results presented in Figure 6.5., the introduction of stiffer penalties alone was not considered by many interviewees as the most effective way forward; therefore, it was suggested this Policy Option should be implemented in combination with the stronger enforcement of the existing rules i.e. Policy Option 1.

Clearly, what is meant by "dissuasive" is subject to some interpretation that may be informed by national practices, however, consideration should be given to the negative cost impacts caused by the non-authorised use of pyrotechnics on the internal market (see Chapter 5). Moreover, the scale of the operations associated with the recent cross-border Poland case (see Chapter 3) suggested that this non-compliant business activity is a highly profitable enterprise.

Therefore, there is a strong case for aligning the penalties to the standards set by the Member States that have established already stringent penalties for this type of criminal activity. In addition, to ensure that the authorities and legal system have the necessary powers for the launching of investigations and the issuing of stringent penalties, it is

suggested that criminal law is used as the guiding framework rather than administrative law.

6.7. Other policies explored with interviewees

Mandatory recording of sender identifications discussed with the courier and postal companies

As part of the interviews with the courier and postal services companies, the suggested Policy Option of mandatory recording of sender identification was explored; the idea was that by recording sender details the web-shops would find it difficult to send their unlabelled packages anonymously as is currently the case.

However, all companies interviewed were against the idea for several reasons, including that fake IDs could be used, it would increase the administrative burden for the organisations involved in distributing parcels resulting in higher costs for consumers, and the fact that while it would be beneficial to have the means to trace an illicit package to a sender, the package would still need to be seized during inspections of the distribution centres in the first instance.

Rather, the preferred options of the courier and postal companies were scaling-up of EU wide coordination and national enforcement efforts to address non-compliant traders, and dissuasive penalties and law enforcement activities targeting non-authorised users. Also, sharing of information on the details of non-compliant traders and users between companies in the distribution sector was suggested, but it was assumed that this would breach privacy laws.

Other suggested Policy Options by interviewees

Interviewees were provided the opportunity to provide any further suggestions on possible Policy Options.

One interviewee suggested that (flash) bangers of categories F2, F3, F4, T1, T2, P1 and P2 with manually inflaming fuses (not electrical devices) should be banned. It was suggested that the flash bangers with manual fuses are popular on the black market and misused, and that professional pyrotechnicians typically use only those that can be triggered with electric devices at display events. It should be noted that under the Directive Member States already have the power to introduce national bans on F2, F3, T1, T2, P1 and P2 articles.

Moreover, further Policy Options could be explored to prevent F3 and F4 pyrotechnics from being certified as other categories of pyrotechnics (e.g. P1 or P2) where it is clearly not their intended use even if those submitting the pyrotechnics for approval to the Notified Bodies have indicated otherwise. While the exact nature of these requirements were not explored in detail, policy options could be examined to address the issue of miscategorised pyrotechnic articles by Notified Bodies; one option could be the strengthening of the Member States' controls and checks of Notified Bodies.

6.8. Conclusions and recommendations

Conclusions

- Considering the cross-border nature of the problem, obstacles exist for the authorities in the Member States that receive non-compliant sales of F4 pyrotechnics, as they are unable to control directly the activities of traders that make available F4 pyrotechnics to the general public online; this calls for a renewed approach to the enforcement of the Directive through better implementation of the existing rules;

- It does not appear feasible for sellers of F4 pyrotechnics to verify the accuracy of the documentation issued by other Member States testifying that an individual has the necessary specialist knowledge to handle and use such articles;

- There is wide variation in the national penalties (prison sentences and fines) set for the non-compliant sale of F4 pyrotechnics to the general public; moreover, while most Member States have used criminal law to set the penalties, a minority have used administrative law only;

- A clear case was not established to introduce a reform to the harmonised standards considering the need to restrict the non-compliant sale of F4 pyrotechnics to the general public given that this measure would not address the root cause of the problem;

Recommendations

- Overall, the feedback suggested that the optimum route forward would be to introduce a combination of complementary Policy Options;

- The Commission and Member States should coordinate efforts to implement Policy Option 1 (better enforcement of the existing rules). This action should include:

    - scaling-up cross-border and national market surveillance and law enforcement activities;

    - strengthening the role of the AdCo group on Pyrotechnics, for example, by sharing information on enforcement actions that have collected evidence from retailers on whether the sales of F4 pyrotechnics have been conducted with persons with specialist knowledge, and launching a task force and inspection programme investigating online web-shop activities;

    - Making use of existing Commission systems and market surveillance programmes to help facilitate and provide additional resources to support the market surveillance and law enforcement processes, namely the Information and Communication System on Market Surveillance (ICSMS) subject to reforms to permit sharing of information on non-compliant web-shops and the European Coordinated Activities on the Safety of Products Programme;

    - Introduction of measures to ease ongoing cooperation and actions e.g. guidance that is updated periodically indicating the relevant EU authorities and counterparts, enforcement standards and practices, evidence development methods, suggestions for the sharing of information; and the establishment of a specific EU Member States network to support ongoing coordination;

- While the implementation of Policy Option 1 would create the law enforcement conditions necessary to pose a significant problem to those that intend to break the law, these activities would be strengthened through the implementation of Policy Options 2 and 4. Therefore it is recommended that:

    - Policy Option 2 (sub-option 1) is implemented to first introduce a template that can be used on a voluntarily basis of a harmonised form indicating that an individual with specialist knowledge has met the necessary standards to handle and use pyrotechnics in the country where the harmonised form was issued. If the use of such a harmonised form is well-received by a vast majority of Member States, the Commission could consider launching a legislative proposal to introduce the proposed harmonised form by amending the Directive. If it were decided to open the Directive, the requirement to

retain a copy of the harmonised form by economic operators could be introduced in the legal text (although the use of this specific measure could also be encouraged through relevant guidance).

- Policy Option 2 (sub-option 2) is implemented to revise the Directive to enable Member States to prohibit or restrict the possession, use and/or the sale to the general public of category F4 pyrotechnics fireworks, which are justified on grounds of public order, security, health and safety, or environmental protection;

- Policy Option 4 is considered strongly by the Member States to encourage the introduction of stringent penalties for both prison sentences and fines using criminal law; in doing so, consideration should be given to the stiff penalties set already in some Member States as identified in this study.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. Conclusions

Analysis of the online methods for illegal sourcing of pyrotechnics

- Overall, the results suggested that the online pyrotechnic retail market is largely compliant with its legal responsibility of not making available F4 pyrotechnics to the general public through online means. This finding extends to 90% of the 310 company websites reviewed;

- However, based on the sample reviewed, it seemed that about 73% of companies that supply F4 pyrotechnics online do so without implementing specialist knowledge controls. In total, this share represented 32 companies;

- The analysis revealed that 16 non-compliant traders had adapted their sales strategies to target consumers across the internal market through international shipping services; whereas 10 provided several language versions of their websites. Therefore, this illegal business activity should be considered as both an EU and national issue to be addressed;

- The heat map analysis indicated that many of these non-compliant companies marketed extensive product ranges, suggesting that they sell extensive product volumes to cater for a range of unauthorised user preferences;

- Pyrotechnic expert feedback suggested that some non-compliant traders make professional fireworks available to the public in the run-up to the New Year's Eve celebrations only;

- Considering the outcome of the mapping exercise, it seemed that there are enforcement and compliance gaps in some Member States relating to the requirements of Article 7(3);[99]

Assessment of the illegal supply and use of F4 pyrotechnics

- Evidence collected on the illegal sale of F4 pyrotechnics online to the general public has indicated that it is a significant black market enterprise for Organised Crime Groups (OCGs). A recent investigation in Poland in December 2018 resulted in the seizure of 80 tonnes of F4 pyrotechnics, enough to fill four large shipping containers. After assessment of the evidence, it was estimated that the OCG shipped 1000 kg of F1 to F3, and 500 kg of F4 pyrotechnics to different Member States per day;

- The EU-wide research of the illegal sale of F4 pyrotechnics to the general public experienced difficulties because the phenomena is hidden from the authorities; the commercial transactions take place online between non-compliant web-shops and non-authorised users, with the products shipped in unlabelled parcels from one Member State to another, making official monitoring of the situation highly problematic;

- The extent of the illicit purchase and use of F4 pyrotechnics by non-authorised users is likely to vary significantly between Member States. However, while it is probably the case that some Member States experienced limited negative activities, the volumes of F4 pyrotechnics seized in the Poland case in December 2018 suggested a much bigger problem than that reported by authorities and other stakeholders responding to the study consultation processes;

[99] Manufacturers, importers and distributors shall not make available on the market the following pyrotechnic articles except to persons with specialist knowledge: (a) fireworks of category F4;

- Authorities and other stakeholders have underestimated the proportion of online retailers that sell F4 pyrotechnics online without specialist knowledge controls. Based on the sample analysed by the mapping activity, it seemed that the proportion of non-compliant traders is around 73% whereas the average online survey response suggested a figure of 16%;

- It was confirmed that online web-shops based in other Member States are the main source of F4 pyrotechnics purchased for use by non-authorised members of the general public. Less common sources include the EU-wide physical transportation of F4 pyrotechnics by Organised Crime Groups (OCGs); the direct or indirect sale of F4 flash bangers from licensed European producer(s) to OCGs; the intermittent illegal production and sale of F4 pyrotechnics by unlicensed criminal producers; and distribution by small-scale intermediaries;

- The responses suggested an uneven distribution of non-authorised usage across the Member States, with Czechia, Denmark, Germany, the Netherlands and Sweden appearing to suffer the most severe problems, with less acute issues reported in Belgium, Cyprus, Estonia, Finland, Luxembourg, Slovakia and the United Kingdom etc. Other countries such as Spain, Portugal and Romania reported no problems whatsoever;

- Unsurprisingly, New Year's Eve was noted as the most common holiday where (F4) fireworks are misused by the general public. To a much lesser extent, F4 pyrotechnics are used as part of other criminal activities to harm persons and/or damage property;

- Postal and courier companies are negatively affected by these trends as they are unable to prevent the anonymous use of their services by non-compliant traders. The non-compliant distribution of unmarked parcels poses serious risks to postal workers and company property and is in clear breach of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) and the Postal Act of the Universal Postal Union (UPU).

Assessment of the law and enforcement framework to address the non-compliant sale and use of F4 pyrotechnics

- The Directive is product-focused, and has been designed to enable the free movement of pyrotechnic articles in the internal market, on the basis of mandatory essential safety requirements for these products and a harmonised system of controlling that such requirements are met as a pre-condition for making them available on the EU market;

- While the Directive does not permit the (cross-border) sale and use of F4 pyrotechnics to the general public, it has not been designed in a way to restrict cross-border crime. For example, although the Directive mandates that users of F4 pyrotechnics must have the necessary specialist knowledge, the different national requirements and documentary evidence related to these qualifications makes it difficult for economic operators and authorities to conduct checks of professionals that have obtained their specialist knowledge from another Member State;

- Cross-border cooperation to tackle the problem was said to be difficult although improving. Obstacles include difficulty to identify relevant counterparts in police authorities in other Member States that are open to following-up on case investigations and the sometimes limited extent to which police authorities consider the illicit sale and use of F4 pyrotechnics as a serious problem;

- There appears to be an uneven enforcement of the Directive with many complaints received that large amounts of F4 pyrotechnics have been sold online and transported from Czechia and Poland illegally to other Member States; the mapping

activity (see Chapter 2) identified further non-compliant traders in Bulgaria, Greece, Lithuania, Luxembourg, Netherlands, Slovakia and Romania;

- Although there have been problems documented in the past, while there is no hard evidence to suggest that the Notified Bodies are not following the agreements made in the Notified Bodies Forum, reports were received that there is a "compliance gap" in the way in which some European Notified Bodies are certifying articles as Categories P1 or P2 as instructed by some European importers of Chinese pyrotechnics; in these cases, these types of categorisations do not reflect the intended use of the articles;

Assessment of the negative (cost) impacts caused by the non-authorised use of F4 pyrotechnics in the EU

- The non-compliant sale and use of F4 pyrotechnics has resulted in a wide range of negative cost impacts. This includes costs incurred by those that sell and use the pyrotechnics illegally, and also by third parties such as the public sector, innocent bystanders, insurance companies, postal and courier companies, property owners, the legitimate pyrotechnics sector etc.;

- Although the data is incomplete, 18 Member States have reported 6566 pyrotechnics accidents to the Commission over the last five years. Some of the accidents have been reported in countries where it is recognised that there are problems with the non-compliant use of F4 fireworks (e.g. Cyprus, Denmark, Netherlands, Italy, Sweden). It is notable that many large Member States are not included in this sample, such as France, Germany, Spain and therefore the numbers provided only give a partial assessment of the trends;

- The analysis of the IDB database performed by Eurosafe provides further insights into the frequency of pyrotechnics accidents. Although issues with the representativeness of the sample were detected, it was suggested that 16,000 pyrotechnics accidents occur each year across the EU Member States, at an estimated hospital cost of 10 million EUR per year, with just over half of the victims being children and young adults;

- A wide range of negative cost impacts resulting from the non-compliant activities have been reported including loss of business and reputational damage to the legitimate pyrotechnics sector, health services costs, policing costs, judicial system costs, vandalism, severe personal injuries, fatalities, damage to property etc.;

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- Considering the cross-border nature of the problem, obstacles exist for the authorities in the Member States that receive non-compliant sales of F4 pyrotechnics, as they are unable to control directly the activities of traders that make available F4 pyrotechnics to the general public online; this calls for a renewed approach to the enforcement of the Directive through better implementation of the existing rules;

- It does not appear feasible for sellers of F4 pyrotechnics to verify the accuracy of the documentation issued by other Member States testifying that an individual has the necessary specialist knowledge to handle and use such articles;

- There is wide variation in the national penalties (prison sentences and fines) set for the non-compliant sale of F4 pyrotechnics to the general public; moreover, while most Member States have used criminal law to set the penalties, a minority have used administrative law only;

- A clear case was not established to introduce a reform to the harmonised standards considering the need to restrict the non-compliant sale of F4 pyrotechnics to the general public given that this measure would not address the root cause of the problem;

7.2. Recommendations

Analysis of the online methods for illegal sourcing of pyrotechnics

1. Considering the need to ensure a level playing field on the internal market, to protect compliant companies from unfair competition and the general public from safety risks, it is recommended that investigative actions managed by the relevant European and national authorities are initiated nationally and across the EU to tackle the non-compliant traders identified;

2. Moreover, given the need to address both the supply and demand aspects of the problem, it is recommended that unauthorised customers who buy restricted F4 articles, including those customers based in Member States other than where the web-shops are located, are profiled and investigated, implying that cross-border cooperation is needed between the relevant authorities to share information and other relevant resources;

- To strengthen the enforcement of the requirements set by Article 7(3) [100], we suggest that the Commission and all authorities involved consider the results of the Policy Options analysis so that the suggested policy initiatives can be instigated to address the problem.

Assessment of the illegal supply and use of F4 pyrotechnics

3. The feedback suggested that the use of sniffer dogs to detect (F4) pyrotechnics contained in unlabelled packages had been an effective measure when used by the courier and postal services in their warehousing facilities. It is suggested that these types of activities are scaled-up with the support of the Member States to enhance the detection of (F4) pyrotechnics transported illegally;

4. Echoing the recommendations from Chapter 2, more systematic screening and controls on web-shops by market surveillance and enforcement authorities seems appropriate in the light of the results of this study.

Assessment of the law and enforcement framework to address the non-compliant sale and use of F4 pyrotechnics

5. The review of the national penalties indicated that there is wide variation in the types of maximum prison sentences and fines set. Where the maximum national penalties are not very stringent, these could be reviewed considering the types of comparatively stronger maximum penalties established in other Member States;

6. Notified Bodies shall ensure a correct categorisation of pyrotechnic articles in line with their intended use. Furthermore, checks should be carried out by market surveillance authorities to determine whether the products are placed on the market

[100] Manufacturers, importers and distributors shall not make available on the market the following pyrotechnic articles except to persons with specialist knowledge: (a) fireworks of category F4

according to the correct intended use (e.g. if a pyrotechnic article is certified as a P1 article, it cannot be marketed as a firework).[101]

Multicriteria analysis of the Policy Options

7. Overall, the feedback suggested that the optimum route forward would be to introduce a combination of complementary Policy Options;

8. The Commission and Member States should coordinate efforts to implement Policy Option 1 (better enforcement of the existing rules). This action should include:

    - scaling-up cross-border and national market surveillance and law enforcement activities;

    - strengthening the role of the AdCo group on Pyrotechnics, for example, by sharing information on enforcement actions that have collected evidence from retailers on whether the sales of F4 pyrotechnics have been conducted with persons with specialist knowledge, and launching a task force and inspection programme investigating online web-shop activities;

    - Making use of existing Commission systems and market surveillance programmes to help facilitate and provide additional resources to support the market surveillance and law enforcement processes, namely the Information and Communication System on Market Surveillance (ICSMS) subject to reforms to permit sharing of information on non-compliant web-shops and the European Coordinated Activities on the Safety of Products Programme;

    - Introduction of measures to ease ongoing cooperation and actions e.g. guidance that is updated periodically indicating the relevant EU authorities and counterparts, enforcement standards and practices, evidence development methods, suggestions for the sharing of information; and the establishment of a specific EU Member States network to support ongoing coordination;

9. While the implementation of Policy Option 1 would create the law enforcement conditions necessary to pose a significant problem to those that intend to break the law, these activities would be strengthened through the implementation of Policy Options 2 and 4. Therefore it is recommended that:

    - Policy Option 2 (sub-option 1) is implemented to first introduce a template that can be used on a voluntarily basis of a harmonised form indicating that an individual with specialist knowledge has met the necessary standards to handle and use pyrotechnics in the country where the harmonised form was issued. If the use of such a harmonised form is well-received by a vast majority of Member States, the Commission could consider launching a legislative proposal to introduce the proposed harmonised form by amending the Directive. If it were decided to open the Directive, the requirement to retain a copy of the harmonised form by economic operators could be introduced in the legal text (although the use of this specific measure could also be encouraged through relevant guidance).

[101] Article 6(1): Pyrotechnic articles shall be categorised by the manufacturer according to their type of use, or their purpose and level of hazard, including their noise level. **The notified bodies** referred to in Article 21 **shall confirm the categorisation** as part of the conformity assessment procedures referred to in Article 17

- Policy Option 2 (sub-option 2) is implemented to revise the Directive to enable Member States to prohibit or restrict the possession, use and/or the sale to the general public of category F4 pyrotechnics fireworks, which are justified on grounds of public order, security, health and safety, or environmental protection;

- Policy Option 4 is considered strongly by the Member States to encourage the introduction of stringent penalties for both prison sentences and fines using criminal law; in doing so, consideration should be given to the stiff penalties set already in some Member States as identified in this study.

ANNEX 1 MAXIMUM NATIONAL PENALTIES SET FOR THE ILLEGAL SALE OF F4 PYROTECHNICS

No	Member State	Type of offence	Penalties	Further measures used if any	Title of law
1	AT	Administrative offence for the sale and uses of F4s	Police authorities enforce the law with penalties for illicit traders of up to 6 weeks in prison and fines up to €10,000.	Further measures include revoking of licenses, property and personal searches, and confiscation of fireworks.	Bundesgesetz, mit dem polizeiliche Bestimmungen betreffend pyrotechnische Gegenstände und Sätze sowie das Böllerschießen erlassen werden (Pyrotechnikgesetz 2010 - PyroTG 2010), BGBl. I Nr. 131/2009[102]
2	BE	NO DATA RECEIVED			
3	BG	Criminal	There are no maximum prison sentence limits. The length of the prison sentences are determined by judges. The lowest defined penalty is from 500 leva (250 euro) to 2 000 leva (1 000 euro) per person.	No data received	No data received
4	CY	Criminal offence	Up to 10 years imprisonment or/and up to €17.000 fine.	Further measures include revoking of licenses, property and personal searches, and destruction or confiscation of fireworks.	The Explosives Substances Law, The Explosives Substances Regulation and the Essential Requirements (pyrotechnic articles) Regulations[103]
5	CZ	Administrative law	Prohibition of sale and withdrawal from the market. Maximum fine of CZK 5 million.	The Trade Licensing Office is entitled to revoke a business license in the case of an offense related to the subject of the business. (also imposes sanctions for illicit business and business beyond the scope of business authorization)	Act 206/2015 Coll on Pyrotechnic Products and the Handling of Pyrotechnic Products and on the Amendment to Certain Acts (Pyrotechnics Act)[104]
6	DE	Administrative law	A fine up to 50, 000 EUR Prison sentence up to 5 years	No data	The German Act of Explosives
7	DK	Criminal offence	Cases are handed over to the police who typically enforce the law with fines from €600 to €1200 and occasionally in serious circumstances	Authorisations can be revoked but this procedure is not used currently.	Executive Order No 1424 of 16 December 2009 on fireworks and other pyrotechnic articles

[102] Rechtsinformationssystem des Bundes: ” Bundesrecht konsolidiert: Gesamte Rechtsvorschrift für Pyrotechnikgesetz 2010, Fassung vom 09.04.2019”

[103] The Mines Service: “Legislation – Explosives Substances”. Available at: http://www.moa.gov.cy/moa/mines/minesSrv.nsf/dmllegexplosives_en/dmllegexplosives_en?OpenDocument

[104] Ministry of Industry and Trade (2016): “Act on fireworks”. Available at: https://www.mpo.cz/en/business/standardization/news/act-on-fireworks--180175/

			with prison sentences of up to 2 years.		
8	EE	Administrative law for companies (criminal law for persons)	Punishable by a fine of up to 200 fine units. One fine unit equals 4 euros. The same act, if committed by a legal person (company), is punishable by a fine of up to 32 000 euros. The maximum prison sentence possible for breaking a law related to F4 pyrotechnics is 5 years (if there is a threat to the lives or health of many people) or 3 years (if there is a threat to the lives or health of many people but it is a case of incautiousness/negligence). Prison sentence is only possible in case an act is committed by private person. If the act is committed by company only fine is possible.	Other measures apart from the penalties can also be used, e.g. revoking licences.	Explosives Act § 48: Violation of requirements for transfer of pyrotechnic article or explosive[105]
9	EL	Criminal and administrative law	1. Prison sentences a. Illegal import, manufacture and trading of category f4 pyrotechnics, is punished by at least three months imprisonment and a fine, if the act isn't punished more severely by a different provision. b. Illegal purchase, transport, possession and use of category f4 pyrotechnics, is punished by up to one year imprisonment and a fine, as long as the act isn't punished more severely by a different provision. 2. Fines Common Ministerial Decision Nr.127200/DTBN 2234/Section D/F. 14.3, illegal sales of pyrotechnic articles, which are under restriction or prohibition, could result in fines from 10.000Euros up to 50.000Euros.	No data was received	No data was received
10	ES	Administrative law	The penalties set for serious infringements range from € 601 to € 30,000 plus the seizure of the material and the closure of the establishment for a period not exceeding 6 months. For very serious infringements, the penalties range from € 30,001 up to € 600,000 with the closure of the establishment between 6 months and 2 years plus the seizure of the material.	No information received.	In Spain, the penalties are legally designated by the "Reglamento de artículos pirotécnicos y cartuchería" approved by Royal Decree 989/2015 of October 30.[106]

[105] Riigi Teataja (2018): "Explosives Act".
Available at: https://www.riigiteataja.ee/en/eli/502072018001/consolide

[106] Global Regulation (2015): "Royal Decree 989/2015, On 30 October, Which Approves The Regulation Of Pyrotechnic And Cartridges."
Available at: https://www.global-regulation.com/translation/spain/1428764/royal-decree-989-2015%252c-on-30-october%252c-which-approves-the-regulation-of-pyrotechnic-and-cartridges.html

11	FI	Criminal law	Penalties include fees and/or two years in prison depending on the severity of the crime	Confiscation of fireworks	Criminal Code of Finland (39/1889) Chapter 44, Section 11 Act on the Safe Handling of Dangerous Chemicals and Explosives (390/2005) Section 125
12	FR	Administrative	Article L. 557-58, of the Environmental Code provides that "Without prejudice to Article L. 171-8, the administrative authority may order payment, without prior notice, of a fine, which may not be greater than € 15,000; plus, where applicable, a daily penalty payment that may not exceed € 1,500 applicable from the decision fixing it and until satisfaction of the formal notice".	No information received.	The Environmental Code provides penalties for non-compliance. The sale or illegal use may concern the offenses listed in Articles L. 557-58 (which essentially concerns the conformity of the product) and R. 557-6-10 (which concerns the provision of products to persons and their use).
13	HR	Criminal offence	- Violators can be sent to prison for illegal sale/use of F4 pyrotechnics of up to 5 years, - the fine is 50.000-80.000 kuna	Confiscation of pyrotechnics, inspection of persons, buildings, area and documentation, taking other necessary investigative actions.	-Kazneni zakon ("Narodne novine" 125/11, 144/12, 56/15, 61/15, 101/17, 118/18) -Zakon o eksplozivnim tvarima te proizvodnji i prometu oružja ("Narodne novine" 70/2017),
14	HU	Administrative offence	No sanctions explicitly related to F4 pyrotechnics, however, there are several laws addressing illicit sale and use of pyrotechnics. Fines can be imposed by either the police, safety inspectors of the Regional Government Office or an authorized agent. However, there are no maximum fine limits or prison sentence limits. The legislation does not indicate unlimited fines or prison sentences either. Therefore, practice and judgement play a larger role in the issuing of penalties than consideration of a limit.	Other measures include revoking licences, and confiscation or destruction of pyrotechnics.	Government Decree No. 173/2011 (VIII. 24.) on Pyrotechnics Activities for Civilian Use, Act XXIV of 2004 on Firearms and Ammunition and Decree of the Minister of the Interior No. 53/2012 (X. 26.) on the Administrative Service Charges Relating to the Authorisation of Pyrotechnics Activities for Civilian Use
15	IE	Criminal offence	The penalties are defined on two levels of fine. 1) The lower level is a fine up to €5.000 and 2) if more serious circumstances the fine is €50.000	No additional further measures. The prosecution before the court would be the ultimate sanction.	Regulations 7 and 34 of S.I 174 of 2015 European Union (Making available on the market of pyrotechnic articles) Regulations 2015
16	IT	Criminal offence	Unless the fact constitutes a more serious offense, anyone sells or in any case delivers fireworks of category F4 and professional pyrotechnic articles of categories T2 and P2 to persons without the qualification and the requirements referred to in Article 5, paragraph 2, or in violation of the foreseen identification and registration	No information received	No information received

			obligations or the provisions of the police licenses, he is punished with imprisonment from six months to three years and with a fine of €30,000 to €300,000		
17	LU	Criminal offence	The making available of products on the market is subject to fines from €251 to €500k and can be extended to €1m for non-compliance. Imprisonment is possible for 8 days to 3 years.	Confiscation and destruction of the goods is possible. Also, the court can confiscate the illicit profits.	Art.19 of law "loi modifiée du 4 juillet 2014 portant reorganisation de l'ILNAS
18	LT	Administrative offence	Fine of up to €1800	Revoking of licences or authorisation.	Article 127 of the Code of Administrative Offenses of the Republic of Lithuania[107]
19	LV	Unlawful supplies are not a criminal offence in Latvia. It is an administrative offence	The maximum fine is €700	No information received.	Article 166[2] Code of Administrative Offenses of the Republic of Latvia[108]
20	MT	No data received			
21	NL [109]	Criminal offence	Up to 6 years in jail for selling F4s to the public. For smaller cases, fines of up to €83,000 can be issued. For smaller cases, there could be obligatory public duties (work such as cleaning public space).	Revoking specialist knowledge and storage licences, fines for storing fireworks without a licence.	No information received.
22	PL	Both criminal and administrative offence	The financial penalties are up to PLN 100.000 and there is a possibility for imprisonment for up to 3 years	Written warnings, licences revoked, or authorisation revoked.	Dz. U. 2002 No. 117 pos. 1007 (Act of 21 June 2002 on explosives for civil use)
23	PT	Criminal offence	It depends on the type of crime and the place where it's committed but prison sentences related to offences concerning F4 pyrotechnics are up to a maximum of 4, 5 or 12 years. It depends on the type of crime and the place where it's committed, but for offences related to F4 pyrotechnics, the fine is fixed by the court in days, up to maximum of 480 or 600 days, corresponding for each day an economic penalty between €5 and € 500, depending on the economic situation of the convicted person and his personal expenses.	Home searches, seizures of pyrotechnic articles and documents may be authorized, as well as other measures such as revocations of licenses and other authorizations.	Law 50/2013

[107] Lithuanian Republic (2015): "Lietuvos Respublikos. Administracinių nusižengimų kodekso patvirtinimo, įsigaliojimo ir įgyvendinimo tvarkos įstatymas".
Available at:
https://www.e-tar.lt/portal/en/legalAct/4ebe66c0262311e5bf92d6af3f6a2e8b/yKQsyNkCBU
[108] Legal Acts of the Republic of Latvia: "Latvijas Administratīvo pārkāpumu kodekss"
Available at: https://likumi.lv/ta/id/89648-latvijas-administrativo-parkapumu-kodekss
[109] Interestingly, the Netherlands is currently exploring if it is possible for rent tenancies and mortgages to be terminated if persons are caught storing large quantities of F4s in their homes without a license. Also, it is being examined if the municipalities can issue fines in these cases.

24	RO	Criminal offence	Imprisonment from 3 months to one year, or a fine.	Further measures include revoking of license, and confiscation of fireworks as evidence for the court.	Law no 126/1995 (revoking of license) and Penal Code – Law no 286/2009 (confiscation of fireworks)
25	SK	No data received			
26	SL	No data received			
27	SE	Criminal offence	In the most serious cases, the illicit sale of F4 pyrotechnics may be sentenced to 5 years in jail. The fines for crime to sell F4 fireworks to persons without necessary permissions may vary between 1500 and 150 000 Swedish Crowns, dependent on the severity of the crime, the income and the wealth of the offender.	An administrative measure is withdrawal of permissions.	29 a § Swedish Act on Explosives and Flammables (SFS 2010:1011)[110]
28	UK	Criminal offence	The maximum penalty is an unlimited fine or imprisonment for a term not exceeding 2 years or both.	No information received.	Pyrotechnic Articles (Safety) Regulations 2015[111]

[110] Sveriges Riksdag (2018): " Lag (2010:1011) om brandfarliga och explosiva varor". Available at: http://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-20101011-om-brandfarliga-och-explosiva_sfs-2010-1011

[111] Legislation.gov.uk (2015): "The Pyrotechnic Articles (Safety) Regulations 2015". Available at: http://www.legislation.gov.uk/uksi/2015/1553/contents/made

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