



Climate

More Chilling Than Ever

Tackling Europe's ongoing illegal trade in HFC climate super pollutants

April 2024





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ACKNOWLEDGEMENTS

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ABOUT EIA

We investigate and campaign against environmental crime and abuse. Our undercover investigations expose transnational wildlife crime, with a focus on elephants, pangolins and tigers and forest crimes such as illegal logging and deforestation for cash crops such as palm oil. We work to safeguard global marine ecosystems by addressing the threats posed by plastic pollution, bycatch and commercial exploitation of whales, dolphins and porpoises. Finally, we work to avert climate catastrophe by strengthening and enforcing regional

and international agreements that tackle short-lived climate super-pollutants, including ozone-depleting substances, hydrofluorocarbons and methane, and advocating corporate and policy measures to promote transition to a sustainable cooling sector and away from fossil fuels. We use our findings in hard-hitting reports to campaign for new legislation, improved governance and more effective enforcement. Our field experience is used to provide guidance to enforcement agencies and we form partnerships with local groups and activists and support their work through hands-on training.

OUR CLIMATE WORK

Our Climate programme seeks to keep global warming below 1.5°C and meet the climate challenge through rapid, sustained reductions of emissions of all the major greenhouse gases. This will be achieved by developing,

implementing and enforcing ambitious national, regional, global and sectoral obligations to reduce emissions of ozone-depleting substances (ODS), fluorinated gases (F-gases), methane (CH₄), nitrous oxide (N₂O) and carbon dioxide (CO₂). These obligations should be reinforced by strong governance frameworks ensuring corporate accountability and sustainable financing for a just and fair transition for all.

EIA is the only NGO committed to combating HFC and ODS climate crime and has almost 30 years of experience investigating and exposing this criminal trade. Our groundbreaking investigations have helped change laws to better protect our planet. Our work also focuses on promoting rapid greenhouse gas mitigation opportunities through the uptake of climate-friendly HFC-free cooling solutions.

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Front cover, ©Guardia Civil: Officers raid a suspected store of illegal HFCs in Spain

Above: HFC climate crime remains an ongoing problem across the EU.



Executive summary

Five years after EIA first revealed a widespread European illegal trade in hydrofluorocarbon (HFC) climate super pollutant gases, a new investigation has revealed that significant levels of trafficking persist, despite the worsening climate emergency.

Commonly used in refrigeration and air-conditioning, HFCs are being phased out under the European Union (EU) F-gas Regulation. Driven by high profits and weak law enforcement, organised criminals are closely associated with this illicit trade.

EIA's previous investigation, 2021's Europe's Most Chilling Crime, highlighted Romania as a key entry point for illegal HFCs arriving in the EU. In our latest investigation, we uncovered evidence of traders routing illegal HFCs (sourced primarily in Türkiye and China) from Europe's edge – Bulgaria – across the continent to the likes of Greece, Germany, France, Italy, Portugal and Spain.

The investigation demonstrated that traders are becoming more sophisticated and adapting their tactics to elude detection, for example by avoiding banned disposable cylinders and disguising HFCs as less regulated hydrofluoroolefin (HFO) refrigerant alternatives.

EIA analysis of reported HFC seizures shows a decline in recent years. Whilst the reasons for this are not clear, it may suggest lower levels of enforcement activity, or smugglers adapting their methods. Trade data analysis

Above: Cutting HFC use is one of the most effective tools to help prevent runaway climate change.

indicates that carbon dioxide equivalent (CO₂e) EU HFC imports have not declined since 2019 and even increased slightly in 2022.

Illegal HFC trade not only worsens climate change but has also been linked to tax evasion and organised crime. Successful collaboration between environmental and tax enforcement authorities in Spain offers a potential model for future enforcement initiatives.

The EU has recently revised its F-gas Regulation, offering enforcement agencies additional tools to combat illegal trade; however, their efficacy will depend upon effective implementation. There is an urgent need to raise awareness of the new measures amongst the enforcement community.

Globally, HFCs are being phased down under the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer. As countries around the world begin to reduce HFC consumption, important lessons can be learnt from the European experience. There is a clear need to invest and strengthen monitoring, reporting, verification and enforcement under the Protocol, to ensure it is fit to meet the complex challenges posed by the global HFC phase-down, which in developing

countries is taking place simultaneously with the final phase-out of ozone-depleting substances (ODS).

Ultimately, the illegal trade in HFCs is fueled by ongoing demand for the gases, primarily used in the cooling sector, and there is an urgent need to find better ways to keep cool. European governments, businesses and consumers have an important role to play in the purchasing choices they make, including online marketplaces which need to be more proactive in reporting and removing suspected illegal HFCs from their platforms. EIA urges European governments and businesses to build swift HFC exit plans into their net-zero strategies.

EIA calls on the European Commission and all EU member governments to prioritise implementation of compliance related measures under the new F-Gas Regulation.



HFCs and the impact of illegal HFC trade on climate change

HFCs are extremely powerful greenhouse gases commonly used as refrigerants in cooling equipment and heat pumps. Many HFCs have global warming potentials (GWPs) thousands of times higher than carbon dioxide (CO₂).

Their short-lived nature means they have huge near-term climate impacts. HFC and other F-gas emissions are the fastest growing group of greenhouse gases and are responsible for 2.3 per cent of current global greenhouse gas (GHG) emissions. Action to prevent HFC emissions could help slow down the rapid pace of warming we are already experiencing. The Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer was agreed in 2016 in recognition of the threat that HFC emissions pose to the global climate. The gradual phase-down of HFCs under the Kigali Amendment will avoid up to half a degree of warming by the end of the century.

The EU was the first region to meaningfully respond to the threat posed by HFCs, agreeing to the world's first

HFC phase-down in 2014. Under the EU's F-gas Regulation, HFC producers and importers are required since 2015 to hold a quota to be able to place HFCs on EU markets. New entrants can apply for quota, although their allocation is low and must be built up over time. Over time, the total annual quota available has reduced. As HFCs became scarcer, the market price of HFCs soared, reaching peaks of up to 13 times higher than pre-phase-down prices. Although current prices have reduced from their peak, the market price of HFCs in the EU remains significantly higher than that of HFCs outside the EU, particularly in comparison to global south countries where Kigali Amendment HFC phase-down controls have not yet fully taken effect. As the EU further tightens its HFC phase-out schedule, prices may once again rise, increasing the likelihood of illegal trade.



Huge profits from smuggling non-quota HFCs into the EU have attracted the attention of organised criminals. EIA investigations and recent HFC seizures link HFC crime to corruption, bribery, drug smuggling, tax evasion and money laundering.

In addition to breaking the law, illegal HFC trade has serious climate impacts. In 2021, EIA estimated that the carbon-dioxide equivalency (CO₂e) of illegally traded HFCs in the EU could be as high as 30 million tonnes – comparable to the annual emissions of driving 6.5 million petrol cars. As well as leading to additional emissions of HFCs, the illegal trade slows the uptake of greener alternatives by perpetuating HFC demand.

Despite the dire impacts of this climate crime, action on HFCs is not prioritised by enforcement authorities, with relatively few seizures despite a significant amount of illegal trade.

Illegal trade in refrigerant gases is not a new phenomenon; it has always been the Achilles' heel of the Montreal Protocol, the world's most lauded environmental treaty. Signed in 1987, the Protocol adopted a phased approach to reducing the use of ODS, giving developing countries a grace period of 10 years to implement the controls. This principle, which rightly put the onus on industrialised countries to control the production and use of ODS ahead of developing



countries, created fertile conditions for an illegal trade in ODS to emerge and flourish. The reduced consumption and production in developed countries increased the market price of ODS in these regions. At the same time, production growth in developing countries, in particular in China, guaranteed a cheap and plentiful supply of ODS.

The challenges experienced within the EU serve as a warning to the rest of the world as they phase down HFCs. The global phase-down of HFCs presents unprecedented challenges to the Parties of the Montreal Protocol. The bulk of consumption of ODS centred on a small number of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs). In contrast, there are multiple HFCs and more than 150 refrigerant blends containing HFCs available today.

This poses significant monitoring and verification challenges, both to scientists who are measuring and interpreting atmospheric concentrations of the gases as well as to customs officers who are monitoring and authorising cross-border trade.

Opposite page: Wildfires have become increasingly common and destructive

Above left: Refrigerant seizures have been occurring globally for decades.

Above right: Ongoing demand for high GWP gases such as HFC-404A (GWP 4728) has proved lucrative for illegal traders.



The EU's illegal HFC trade

EIA first alerted the world to the problem of HFC climate crime in 2019 with the report *Doors Wide Open*, which highlighted how companies had been brazenly importing non-quota HFCs into the EU soon after the HFC phase-down under the EU F-Gas Regulation was implemented in 2015.

Poland and Bulgaria were identified as the initial key points of entry for illegal HFCs into the EU, with the gases originating from China via Russia and Ukraine in the north-east, and from Türkiye and Albania in the south-east.⁵ In 2021, after increased enforcement efforts by Polish and Bulgarian authorities, EIA investigations revealed Romania to be emerging as an important entry point to the EU. EIA's 2021 report *Europe's Most Chilling Crime* documented how networks of Romanian traders were importing illegal HFCs from Ukraine and Türkiye in order to smuggle them throughout the EU.⁶ The report also drew attention to the wide abuse of transit regulations in facilitating illegal HFC trade.

Despite sharing intelligence with Romanian authorities prior to the release of the report, there has been no indication of any subsequent enforcement action against

the suspects identified. In 2022, a Romanian media outlet reported that some of the cases highlighted by EIA had been referred to a provincial court,⁷ but despite requests to the Romanian Government for further information, EIA has been unable to ascertain the outcome of the court cases.

In December 2023, Romanian customs noted that it will prioritise illegal trade in HFCs through use of newly procured refrigerant identifiers.⁸

Above and right: EIA has previously exposed the scale of illegal refrigerant trade in the EU in two separate reports.

Above, inset: front cover from our 2019 report *Doors Wide Open*.



Investigations

Over the past two years, EIA conducted undercover investigations to gather information about the illegal trade in HFC gases in the EU. The aim was to find out if the situation had changed since EIA's 2021 investigation exposed a pan-European illicit market for HFCs, which largely fell under the radar of law enforcement agencies.

EIA deployed undercover operatives to three locations which had previously played important roles in the illegal HFC market – Spain, Bulgaria and Türkiye. Investigators spoke to numerous HFC traders in each country and the findings revealed that illegal HFCs continue to be imported into the EU and are readily available on the EU market. Traders of illegal HFCs openly use websites such as Facebook Marketplace, eBay and OLX to promote their goods and find new clients.

Findings from the investigations were shared with relevant agencies in order to support enforcement actions.

Not surprisingly, the majority of the HFCs used in the EU, both legal and illegal, are produced in China, the world's largest HFC producer. Under the EU F-gas Regulation, traders must have a sufficient quota, on a CO₂e basis, to place HFCs on the market. If HFCs are placed on the market without quota, they are considered illegal. Demand for illegal HFCs is driven by the large gap in price between quota and non-quota HFCs, as well as the ever-growing demand for cooling equipment, particularly in the summer months.

Above, inset: front cover from our 2021 report *Europe's Most Chilling Crime*.

Country findings

Spain

EIA investigators returned to Spain in 2022, following earlier investigations which had highlighted Spain as an illegal HFC trade hot spot.

A significant trade in illegal HFCs continues in Spain, with non-quota cylinders smuggled in via countries including Türkiye, Ukraine, Poland, France, Serbia and Italy. This black market is fuelled by a combination of high demand for HFCs, limited HFC quota and Spain's national HFC tax. Introduced in 2014, sales of HFCs in Spain are taxed according to their GWP, so gases with a high climate impact are more expensive.⁹ For example, the HFC tax roughly doubles the market price of HFC-134a (GWP 1,530).¹⁰

EIA identified 57 unique online places of sale for HFC gases in Spain, including online marketplaces such as Milanuncios.com and e-commerce websites. Investigators spoke with 12 traders who were able to source large quantities of HFCs (more than five tonnes), raising suspicions of illegal activity. Nine traders offered EIA investigators HFCs in illegal disposable cylinders and two proposed making a transaction without any kind of invoice.

EIA spoke to numerous traders who had ready availability of HFC-404A (GWP 4,728), an HFC gas which is prioritised for phase-out and already banned from most equipment due to its high climate impact. One trader told EIA in May 2022 that the demand for HFC-404A may be on the rise due to a belief that the gas would stop being manufactured soon, suggesting that owning HFC-404A was like owning gold.

"So I tell you, in two or three years, whoever has 404 has gold, I'm going to say it, really. I'm saying it out there, kid, if you've bought three or four bottles, take triple because you'll see."

- HFC trader in Spain

One trader, who uses his daughter's Facebook account to find new customers on Facebook Marketplace, told EIA investigators how he had bought a mixture of both quota and non-quota HFCs, noting that some of them had been seized by Spanish police. The trader claimed to have clients in the industrial cooling and ice industry in Córdoba. Another Spanish trader claimed to have clients in the dairy industry.



Above: Screenshot of trader in Spain from EIA's undercover investigations

"... my bosses are Ukrainian. The problem is that it costs a lot to bring it..... the borders as they are, with the war like this... and there is no gas, people are desperate."

- HFC trader in Spain

Investigators also spoke to a Russian woman based in Barcelona who had posted more than 100 adverts for HFCs on Facebook. The woman, who claimed to have Ukrainian bosses, was actively waiting for a shipment of 1,200 cylinders of HFC-404A. She claimed to have had problems with supply since the outbreak of the war in Ukraine and now tended to source from Poland. A Romanian HFC trader, also based in Spain, told EIA investigators that they continued to source from Ukraine, but that they list the end shipment destination as France to avoid paying the Spanish HFC national tax. The trader claimed that some Spain-based groups of Eastern European HFC traders were in the habit of bringing HFCs into Spain as disposables and then decanting these into refillable cylinders which are less obviously illegal.

Türkiye

EIA expanded investigations into Türkiye, which had emerged as a country of interest in EIA's previous investigation.

Türkiye is in a prime geographic location to serve as a stop-off point for non-quota refrigerant gas making its way from China to the EU. Türkiye has major ports with frequent connections to China and it has a land border with the EU. There is also a known 'moderately high' risk of corruption at the border.¹¹ EIA's intelligence suggests that HFCs are moved illegally from Türkiye into the EU, either by ship to end-user destinations such as Spain or are smuggled in smaller batches by road across the EU's land border with Türkiye.

EIA's investigation revealed that, as of July 2023, the Lima Group, an Istanbul-based company previously identified as heavily involved in smuggling non-quota HFCs into the EU¹² continued to facilitate the smuggling of non-quota HFCs to customers in the bloc.

Bulgaria

EIA also investigated the HFC trade in Bulgaria which, along with Greece, shares a land border with Türkiye.

Travelling via Bulgaria is the quickest route for land vehicles carrying cargo from Türkiye to the rest of the EU. Evidence from seizures and engagement with enforcement officials suggests a steady cross-border trade of non-quota HFCs entering Bulgaria from Türkiye and then moved onwards, via bus and truck, to countries such as Spain, Italy and Germany.

EIA identified 31 companies or individuals selling suspected illegal HFC gases in Bulgaria. This included e-commerce companies such as Apogee99.com and individual traders, many of whom were active on the Bulgarian online marketplace olx.bg. Twenty-eight of these companies or individuals were actively promoting the sale of HFCs in illegal disposable cylinders. EIA also spoke to three traders who were willing to offer cheaper non-quota HFCs for sale without an invoice.

Bulgarian HFC traders told EIA investigators how non-quota HFCs are moved from Bulgaria into countries such as Greece, Germany, Spain, Italy and France by paying bus and truck drivers to stash the cylinders in their vehicles. One trader claimed it was very easy to find willing drivers online.

EIA's investigation also revealed that Bulgarian traders communicate with each other, including about buyers and law enforcement scrutiny, suggesting an organised network. Bulgaria-based HFC traders were found to often use fake accounts for online marketplaces to mask their identities.

EIA's recent investigations suggest that the Lima Group has changed tactics, now commonly labelling HFCs as a popular HFO called R-1234yf in order to avoid inspections.

"They don't pay attention, they don't make control on the customs. 1234- gas, do you know 1234yf- gas?..."

We are changing label and we are preparing the documents, that this gas is 1234 gas and we are sending it."

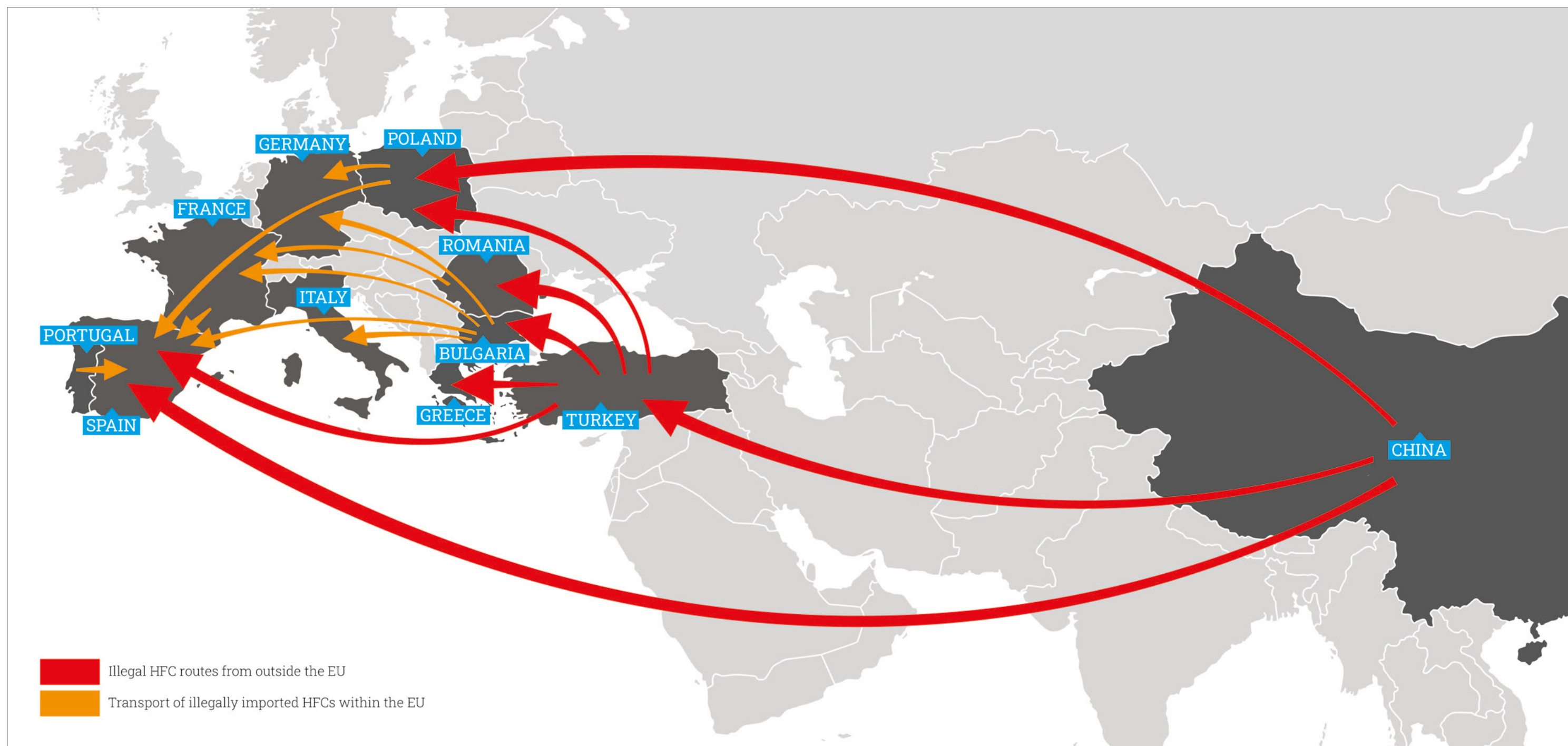
- HFC trader in Türkiye



Above: Screenshot of trader in Bulgaria from EIA's undercover investigations

"I'm working with two people, who work with Spain, they are truck drivers. They travel a lot, they take 10 bottles of the gas, and they put them anywhere, I don't know where they hide them by the transport ... And they deliver them."

- HFC trader in Bulgaria



HFC smuggling methodologies

Illegal HFC traders are using new and ever-evolving methods to stay ahead of law enforcement and smuggle their goods into the EU.

EIA's earlier investigations identified how traders abused EU transit regulations, which allowed non quota HFCs to move through the EU. Smugglers used a variety of methods, including opening and closing transits many times in order to confuse the trail of the goods and often declaring the goods as having exited the EU, when in fact they have been diverted onto the black market.¹³

EIA's previous investigations also demonstrated how traders acted in a consortium (in which only one party had a legal quota) to bulk-buy non-quota gas from outside the EU which they would then split into smaller batches to try to bring across the border.¹⁴ Illegal traders continue to use these smuggling methods but have developed additional ways of evading enforcement.

Mis-declaration

EIA's findings demonstrate that HFC traders ship non-quota gas into the EU by mis-declaring cylinders to avoid scrutiny by customs agents.

One of the main methods is to mislabel cylinders as HFOs, especially HFO-1234yf which is a widely used refrigerant in mobile air-conditioning and a component of numerous HFC refrigerant blends. HFOs are marketed as alternatives to HFCs. They are not subject to HFC quota in the EU due to their low direct GWP, although they are subject to reporting and monitoring. One major Turkish HFC company suggested using this method to smuggle HFCs from Türkiye to Spain, France and Portugal.

Mis-declaring restricted refrigerants as non-restricted alternatives is a method that has been commonly used to smuggle illegal ODS (CFCs and HCFCs). In 2005, EIA investigations highlighted how a German ODS smuggling network was illegally importing ODS from China labelled as HFCs, which at the time were not controlled.¹⁵

EIA's investigation also revealed that smugglers are importing non-quota HFC gas by declaring that shipments contain empty refrigerant cylinders. A major Turkish HFC company claimed to be using this method to help its customers in the EU circumvent F-gas quota regulations.

Above: The illegal trade routes into and within Europe.

Invoice fraud

Illegal traders of HFCs use a range of methods to avoid a financial paper trail for their transactions and to avoid paying tax. One Spanish seller stated that he put the description as “tools” on his invoices. Traders offered cheaper prices without an invoice, requesting payment in cash.

“For example, I send you 500kg and I make you an invoice as tools, or as compressors or as services.” - HFC trader in Spain

For example, one trader offered a price of Bulgarian Lev (BGN) 275 (€140¹⁶) per 12kg bottle of HFC-134a with no invoice, and BGN 520 (€266¹⁷) with an invoice. The price differential between the invoiced and non-invoiced HFCs is significantly more than the value of the VAT alone. Several traders explicitly noted that non-invoiced HFCs would also be non-quota HFCs, as legal HFCs were more expensive.

“Without VAT, this is the price with an invoice, it’s just because the quota is very expensive and that’s why. If there an invoice, there is a wasted quota for the gas. A wasted quota, that’s a big expense.” - Anonymous - online trader

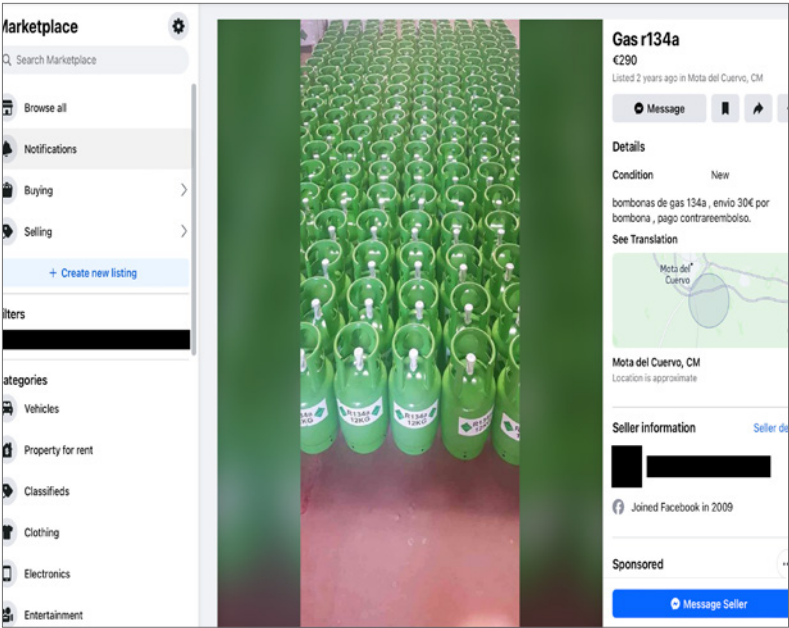
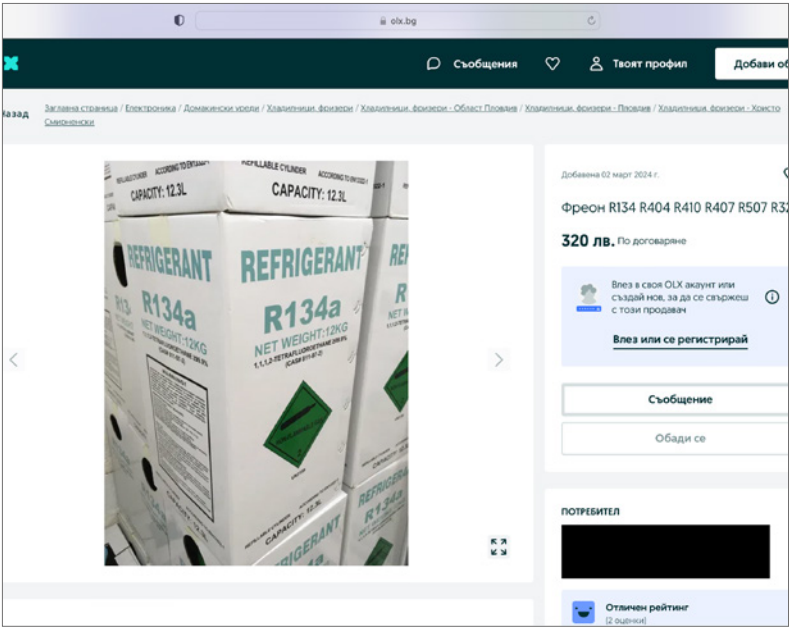
Anonymous adverts on online marketplaces

EIA’s research has found that traders of illegal HFCs throughout the EU continue to post adverts on online marketplaces such as Facebook Marketplace, olx.bg and milanuncios.com, looking for new customers. Sellers often use fake names and list no phone numbers on these adverts, meaning they stand less chance of being identified by law enforcement. In some instances, the same sellers post adverts on the same platforms using multiple accounts and different names.

Small batch shipments

Conversations with illegal traders reveal that there is a widespread practice of splitting up bulk orders of non-quota HFCs into small shipments travelling within the EU to avoid scrutiny and detection by law enforcement.

Spanish traders prefer to trade in this way and truck and lorry drivers involved in smuggling the HFCs across land borders are also believed to operate with small quantities of up to 10 cylinders at a time.



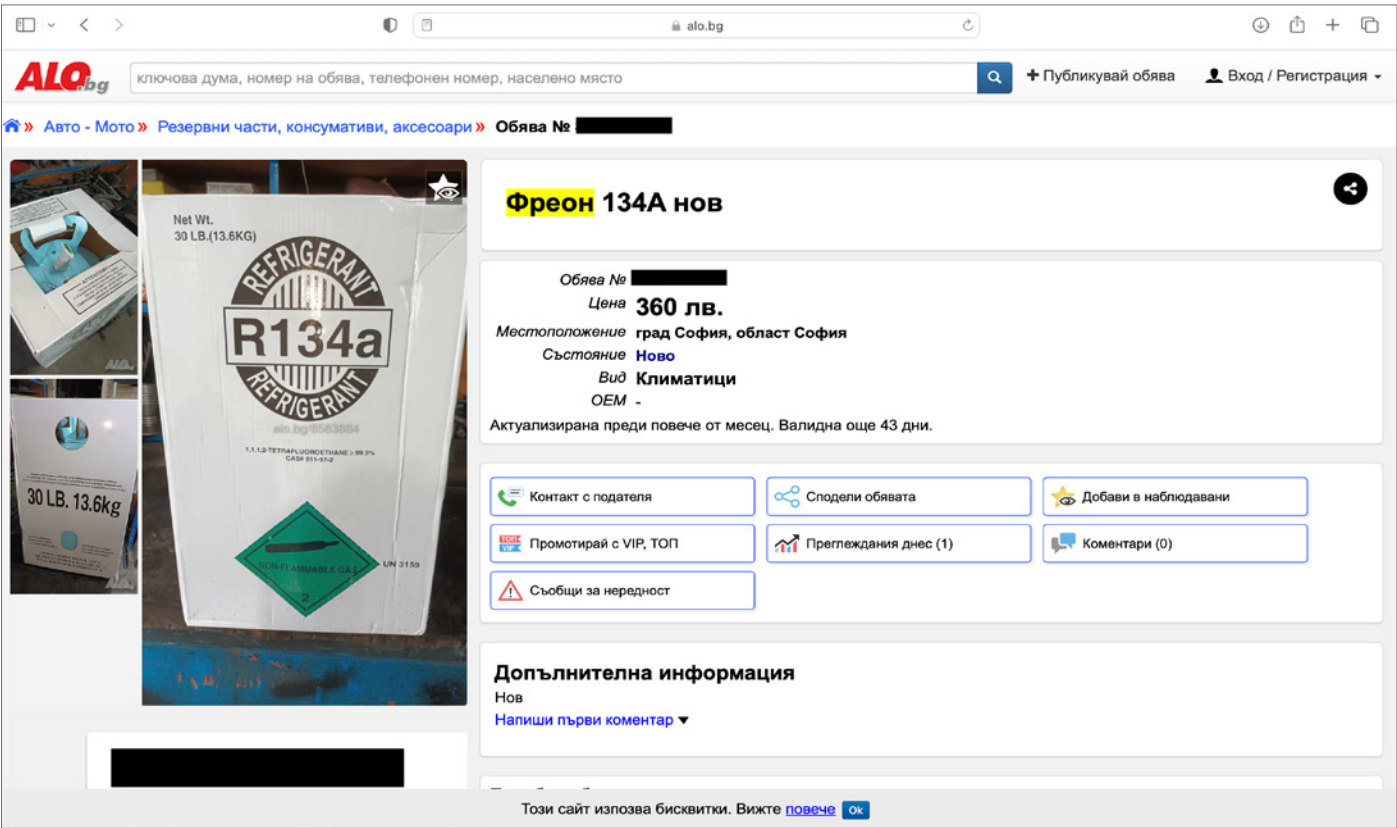
Transfer of gas from disposable to refillable cylinders

One Spanish trader told EIA investigators that individuals involved in the illegal trade sometimes buy cheaper disposable HFC cylinders from outside the EU and then transfer the gas into refillable cylinders once inside the EU (which are less likely to be perceived as illegal by law enforcement and thus easier to sell).

Concealment

EIA investigators spoke to one Spanish trader of illegal HFCs who said market participants often use black plastic film to conceal HFC cylinders when transporting gas across the EU via truck to avoid visual detection by customs officials.

Above: Screenshot of suspected illegal refrigerants being sold on online market places in Spain and Bulgaria.



Top: Illegal HFC 404A mislabelled as HFO alternatives

Above: Screenshot of suspected illegal refrigerants being sold on online market places in Spain and Bulgaria.

Links to financial crime, corruption and organised crime

EIA's latest investigation demonstrates that the illegal trade in HFCs is often linked to financial crime, is regularly enabled by corruption and is often conducted in a manner resembling organised crime.

An organised criminal group is defined by the UN Convention against Transnational Organised Crime as "A structured group of three or more persons, existing for a period of time and acting in concert with the aim of committing one or more serious crimes or offences in order to obtain, directly or indirectly, a financial or other material benefit".¹⁸

Financial crime

Financial crime goes hand-in-hand with the illegal HFC trade in the EU. Tax evasion is pervasive among traders of non-quota HFCs as they are motivated by keeping their illegal sales 'off the record', by being able to trade cheaper non-quota HFCs and by avoiding having to pay country specific taxes (such as Spain's national HFC tax) and sales tax (VAT) as well as income tax on profits earned.

Based on previous estimated levels of illegal HFC trade in the EU, EIA estimates that, between 2018-20, illegal HFC trade would have resulted in the loss of approximately €77 million a year in VAT and customs duties.¹⁹

Bribery and corruption

Bribery and corruption appear to play a significant role in the illegal import of HFCs in the EU. Earlier investigations in 2021 highlighted the prevalence of corruption at customs in illegal trade hot spots such as Romania.²⁰

Corruption of customs agents, particularly in EU border countries such as Bulgaria, remains a problem. One trader told EIA investigators that he paid bribes to Turkish customs officers to send illegal non-quota HFCs to the EU by ship.

Organised crime

EIA investigations confirm that the illegal HFC trade in Europe often bears the hallmarks of organised criminal activity. Individuals trading illegal HFCs on large scale over extended periods of time typically work with organised international networks.

EIA investigators spoke to a number of Spain-based traders who work together with individuals based in Eastern Europe, including in Ukraine. Additionally, traders in Bulgaria's capital, Sofia, appeared to be in regular communication with each other to share information on law enforcement scrutiny.

Enforcement efforts

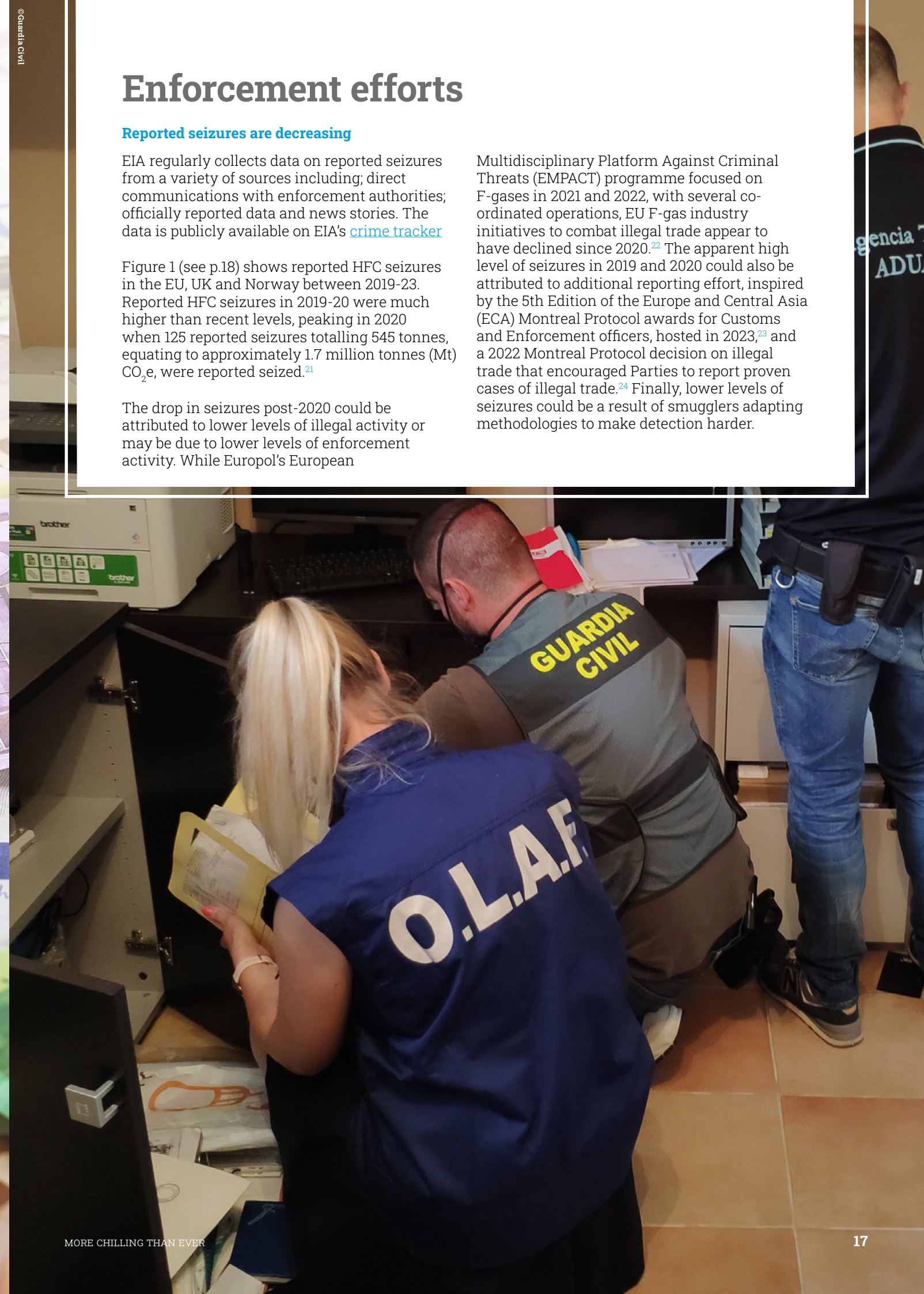
Reported seizures are decreasing

EIA regularly collects data on reported seizures from a variety of sources including; direct communications with enforcement authorities; officially reported data and news stories. The data is publicly available on EIA's [crime tracker](#)

Figure 1 (see p.18) shows reported HFC seizures in the EU, UK and Norway between 2019-23. Reported HFC seizures in 2019-20 were much higher than recent levels, peaking in 2020 when 125 reported seizures totalling 545 tonnes, equating to approximately 1.7 million tonnes (Mt) CO₂e, were reported seized.²¹

The drop in seizures post-2020 could be attributed to lower levels of illegal activity or may be due to lower levels of enforcement activity. While Europol's European

Multidisciplinary Platform Against Criminal Threats (EMPACT) programme focused on F-gases in 2021 and 2022, with several co-ordinated operations, EU F-gas industry initiatives to combat illegal trade appear to have declined since 2020.²² The apparent high level of seizures in 2019 and 2020 could also be attributed to additional reporting effort, inspired by the 5th Edition of the Europe and Central Asia (ECA) Montreal Protocol awards for Customs and Enforcement officers, hosted in 2023,²³ and a 2022 Montreal Protocol decision on illegal trade that encouraged Parties to report proven cases of illegal trade.²⁴ Finally, lower levels of seizures could be a result of smugglers adapting methodologies to make detection harder.



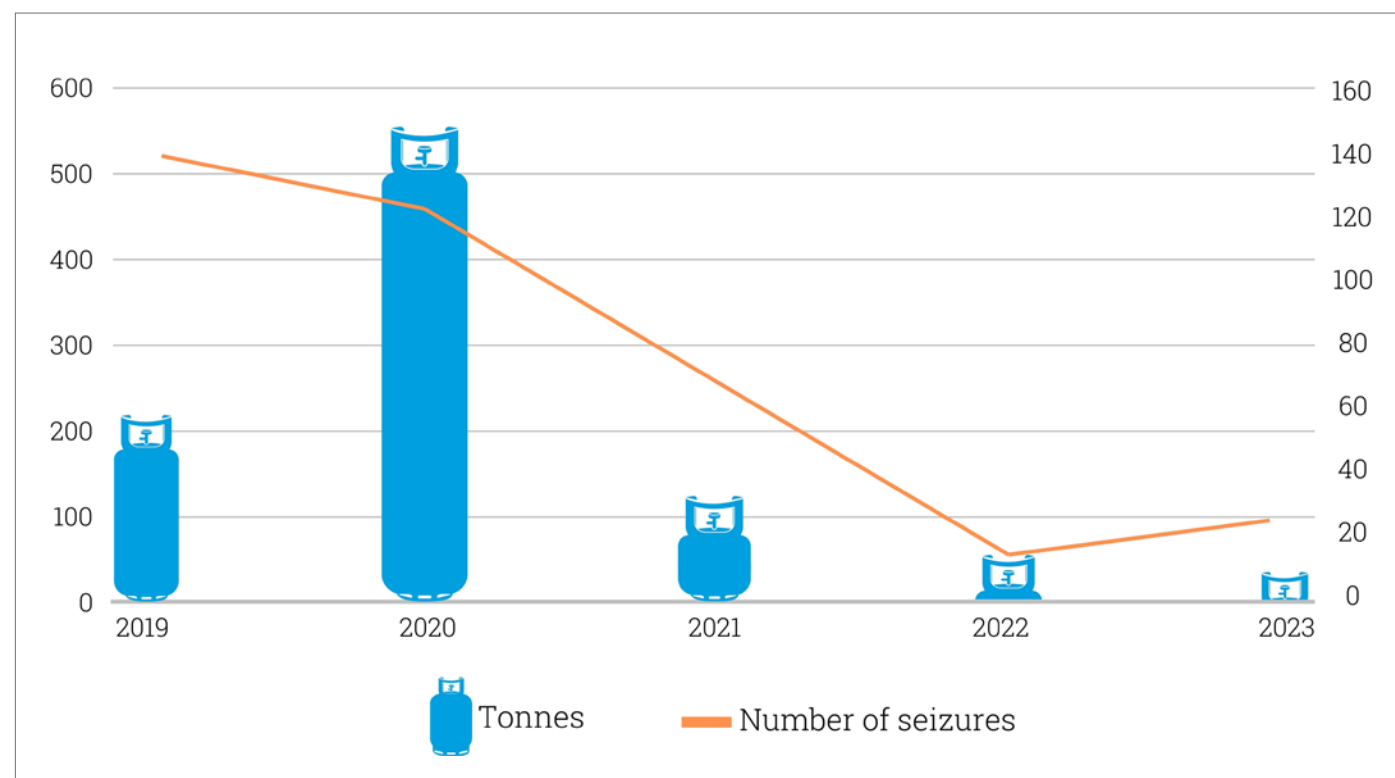
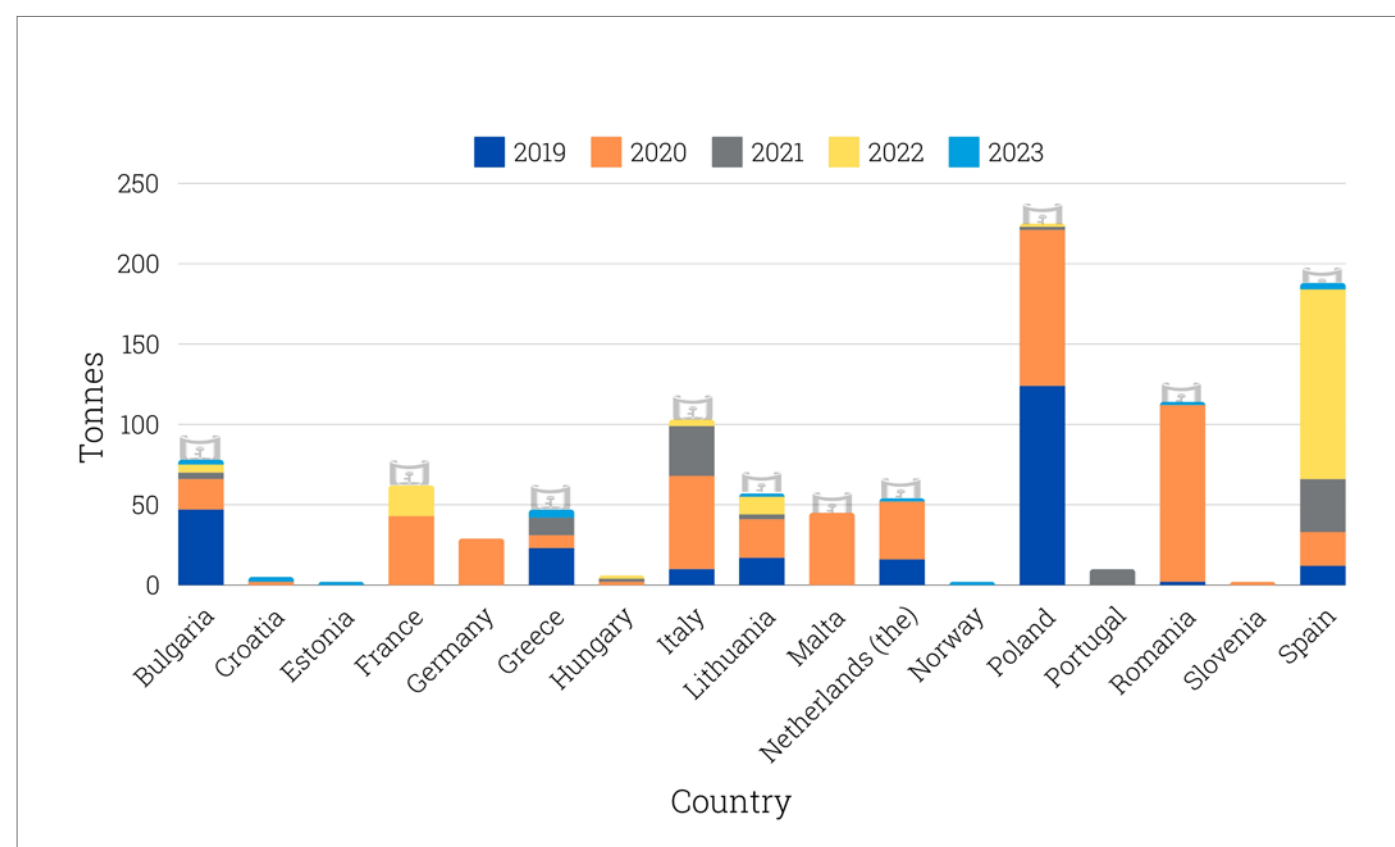


Figure 1: Reported HFC seizures in EU, Norway and UK, 2019-23. Source: EIA Global Environmental Crime Tracker

Figure 2: EU, Norway and UK Refrigerant seized by year and country reporting between 2019-23. Source: EIA Seizure database



Based on EIA's investigations and the easy availability of suspected non-quota HFCs across many EU Member States, it is likely that these seizures only represent the tip of the iceberg.

Figure 2 shows refrigerants seizures by year and country reporting. Not all countries have reported seizures. Over

the period 2019-23, Poland reported the highest volume of seized refrigerants, followed by Spain, Romania, Italy and Bulgaria. One trader told EIA investigators they now source illegal HFCs from Poland following a decline in supply from Ukraine due to the war.

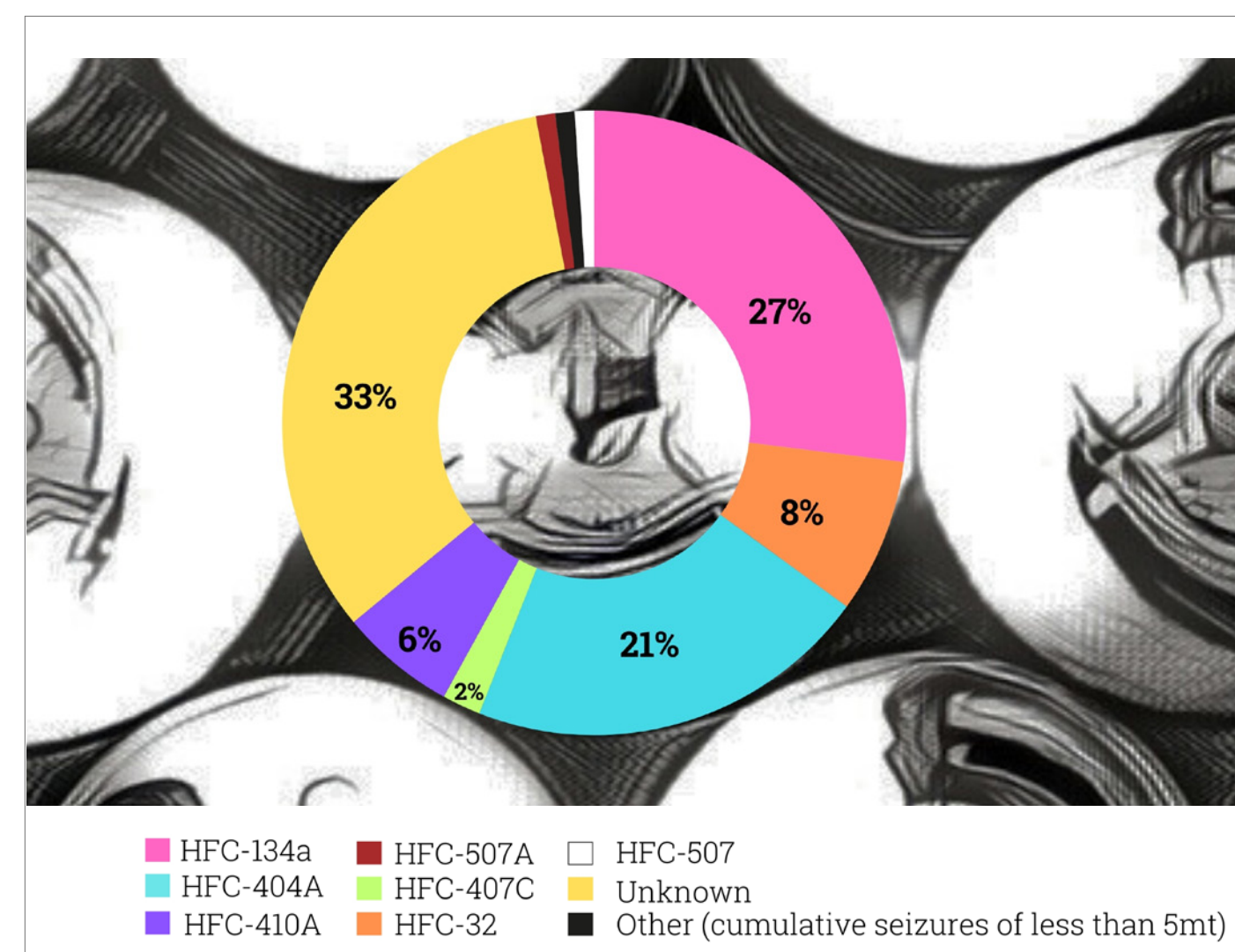


Figure 3: HFC seizures by refrigerant type in EU, Norway and UK, 2019-23 Source: EIA Seizure database

Figure 3 shows the proportion of reported seizures from 2019-23 by refrigerant type. One-third of reported seizures did not have refrigerant type information. HFC-134a represents just over one quarter of seizures, with HFC-404A representing 21 per cent and HFC-32 representing eight per cent. In reality, the proportion of each of these is probably higher, due to the high level of 'unknown' refrigerants.

Despite being targeted for early phase-out given its high GWP, seizures of HFC-404A remain common, indicating that ongoing demand for servicing refrigeration equipment, which should be met by recycled or reclaimed HFC-404A,²⁵ is targeting the illegal market. Seizures of HFC-32 also make up a sizeable proportion (eight per cent), which could also implicate the servicing market for split air-conditioning systems.

Spain dismantles illegal HFC trade networks

In July 2021, EIA exposed numerous vendors using online trading platforms such as eBay and Milanuncios offering HFCs for sale at rates far below the tax inclusive price.²⁶ That month, Spain's Guardia Civil reported the arrest of five people and the seizure of 27 tonnes of HFCs linked to a criminal network distributing illegal HFCs across Europe to clients in Spain, Germany, France and Portugal.

Police uncovered documentation indicating that the network had illegally imported a further 180 tonnes (more than 234,000 tonnes CO₂e) of HFCs.²⁷ Key to these investigations was the co-operation with national tax agencies and the EU Anti-Fraud Office (OLAF).

In 2022, the Spanish authorities identified a further network of companies involved in importing HFCs from China to the Spanish port of Valencia. Facilitated by a company in neighbouring Portugal, the HFCs were declared as 'in transit' towards a final destination outside of the EU, when in fact they remained in Spain. The network used well-known money laundering techniques to process the profits, including purchasing luxury cars and real estate and the creation of a fake travel agency, whereby clients bought HFCs in the name of holidays.

A total of 27 people were arrested and 110 tonnes of F-gases, valued at €11 million, seized. Authorities also seized large amounts of cash, cocaine and ecstasy at premises owned by the network.²⁸

More recently, following intelligence shared by EIA, the Guardia Civil detected a case of illegal HFCs imported from Türkiye. In April 2023, a Spanish trader was arrested for trading illegal HFC-404A. The HFCs had been imported in bottles labelled as HFO-1234yf.²⁹



Trade data analysis

Methodology

EIA examined HFC and HFO customs data (Eurostat) to compare reported trade in bulk HFCs from 2016-22 with company-reported HFC Registry data presented by the European Environment Agency (EEA).

Our analysis relies on the use of Combined Nomenclature (CN) custom codes. These eight-digit codes allow detailed tracking of trade in commodities. However, since 2022, changes have been made to the CN custom codes for F-gases, making direct comparisons of individual gases and their CO₂ equivalencies across years complex.³⁰ Under the previous CN codes, certain gases, including HFC-404A and HFC-507A, were reported individually, whereas under new CN codes they have been combined. In these cases, the GWP value for each new CN code has been calculated using the average or weighted average of each gas, depending on available information.

EIA analysis of EU HFC imports according to customs data indicates that imports by tonnage and CO₂ weighted values have risen slightly since 2019 (see Figure 4 on p.22). The CO₂ weighted increase in 2022 is corroborated by EEA data, which notes that CO₂-weighted total supply of HFCs to the EU in 2022 was about four per cent higher than 2021.³¹

The customs data also shows an increase in imports of HFOs (see Figure 5 on p.22). Notably, the phase-down step in 2021 also coincided with a sharp increase in reported HFO imports. While this may be explained by uptake in HFOs as consumers phase out HFCs, EIA is concerned that it could in part also signal increased illegal HFC imports mis-declared as HFOs in customs documentation.

Left: The contents of refrigerant cylinders being tested by customs officials.

Below: EU trade data can be used to expose unexpected growth in imports and pinpoint potential illegal trade hotspots.





Figure 4: EU 27 HFC Imports between 2016-22. Source: Eurostat

Figure 5: EU HFO Imports. Source: Eurostat

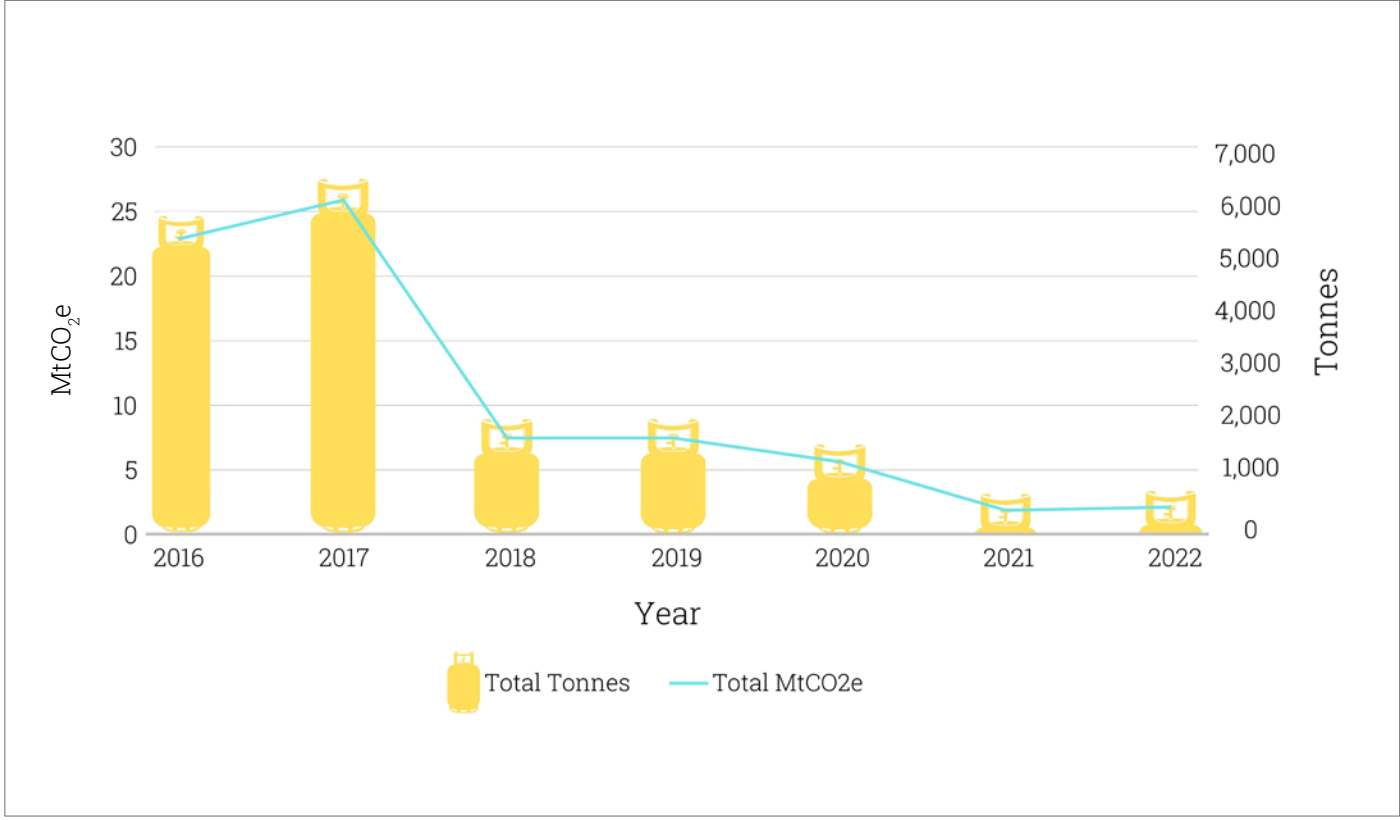
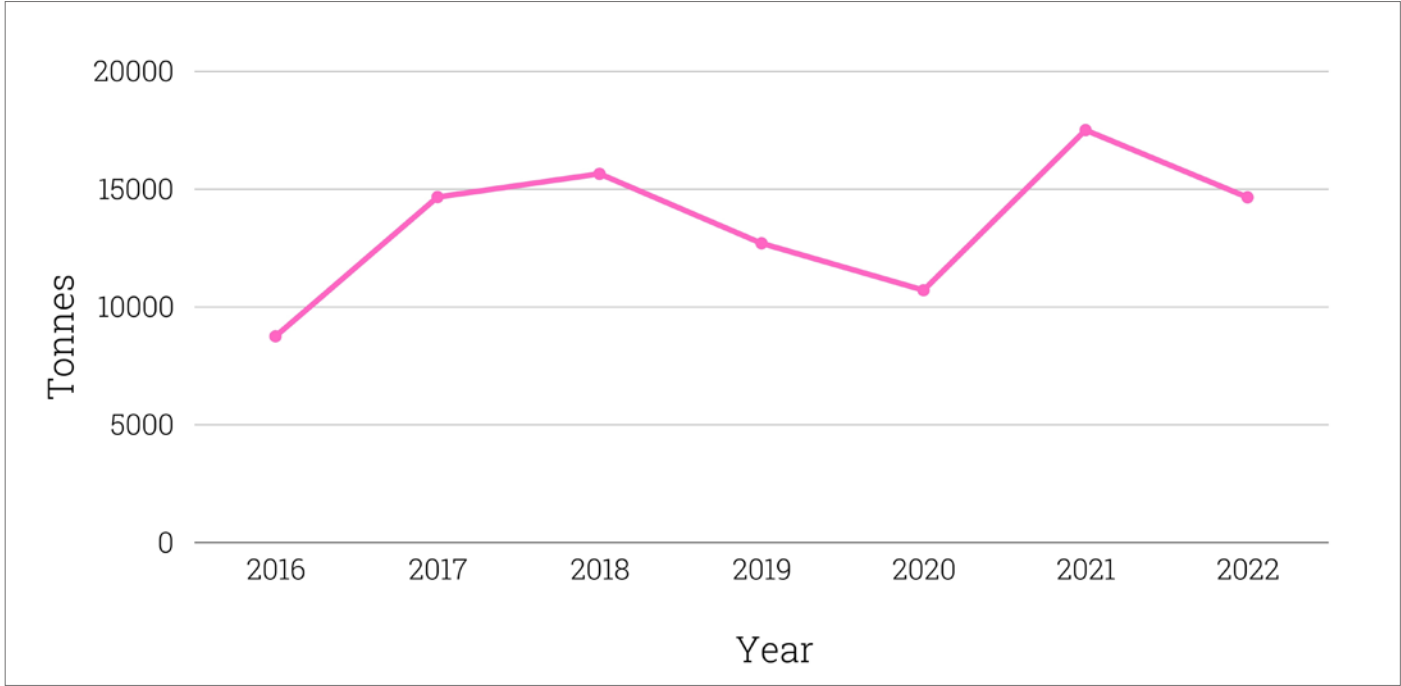
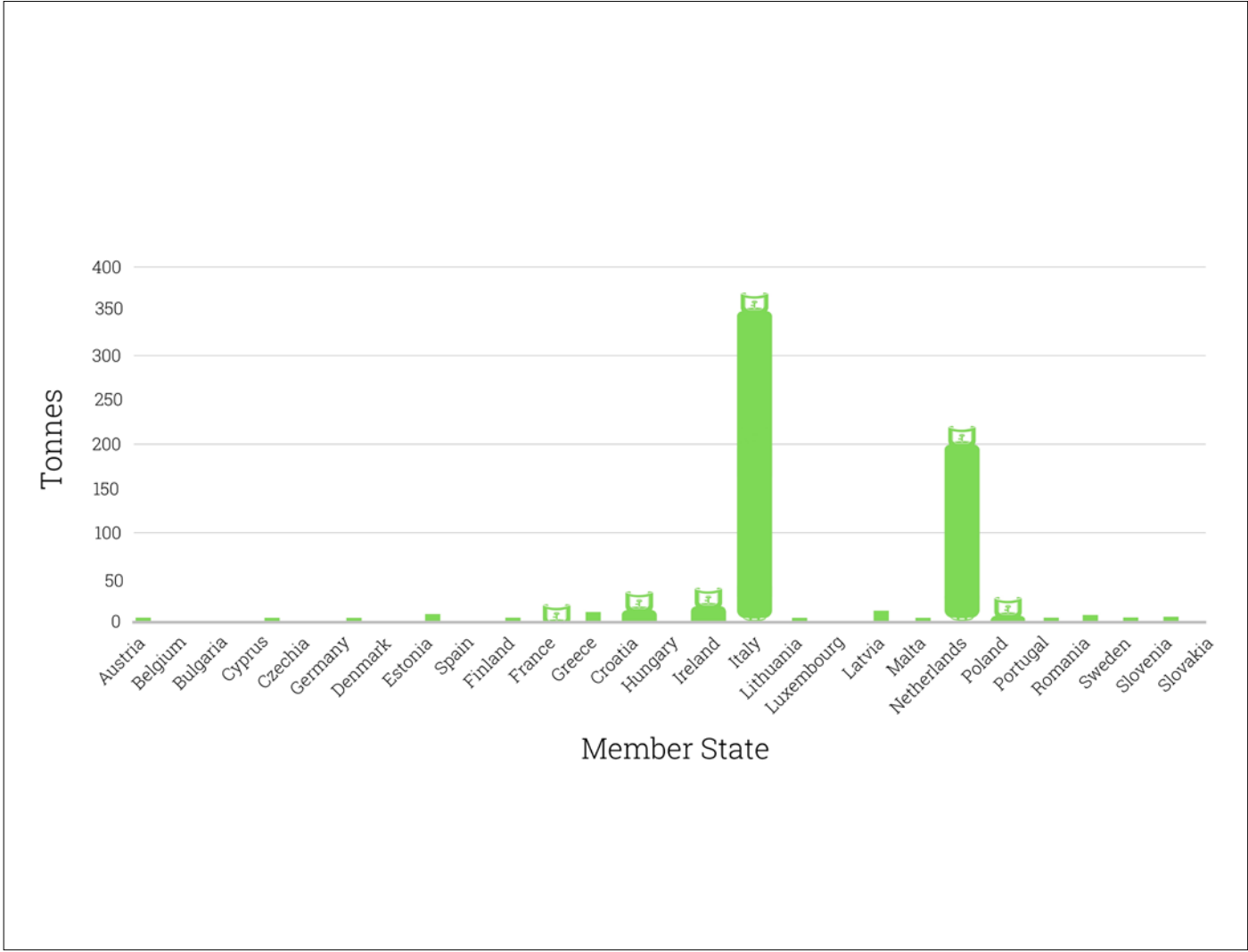


Figure 6: EU 27 HFC-404A and HFC-507A imports. Source: Eurostat

Figure 7: EU Reported HFC-404A and HFC-507A imports 2022. Source: Eurostat



Trade in HFCs with very high GWPs

EU imports of HFCs with very high GWPs, namely HFC-404A (GWP 4,728) and HFC-507A (GWP 3,985), have steeply declined until 2021, with a minor increase in 2022 (see Figure 6 on p.23). Of imports in 2022, Italy has reported an unusually high amount of very high-GWP HFCs (see Fig 7). Italy also has the highest number of companies

reporting activities to the EU's F-gas Registry in 2022 by far: 222 of the 809 companies reporting imports are based in Italy.³² This, combined with some notable HFC seizures, suggests that Italy's role as a potential illegal HFC trade hot spot should be examined further.



Combatting illegal trade through effective regulation – lessons learnt from the EU experience

In 2022, EU consumption of HFCs was already less than half (45 per cent) the maximum required by the Montreal Protocol's Kigali Amendment.³³

The region is leading the world in cutting emissions of these climate super pollutants, with the emergence of the illegal HFC trade an unfortunate side effect of the progressive measures. This has been carefully considered in the recent review of the EU F-Gas Regulation, which has led to the adoption of even more ambitious measures which will avoid an additional 500 MtCO₂e emissions by 2050.³⁴

The revised F-Gas Regulation mandates a complete phase-out of HFCs by 2050, restricts the use of HFCs in key products and equipment such as heat pumps and air-

conditioning by certain dates and includes a number of additional important measures to prevent illegal trade and support compliance.

HFC licensing

Licensing systems, which have been required by the Montreal Protocol since 1997, play a key role in ensuring compliance with quotas and curbing illegal trade.

In the early years of the EU HFC phase-down, the EU experienced significant amounts of 'front door' smuggling, where HFCs were openly imported without quota.³⁵ This was caused by a lack of an effective licensing system; customs officials were unable to determine if an import of HFCs was covered by an HFC

quota. Not all customs offices even had access to the HFC registry and the HFC quota was not monitored by customs in real time.³⁶ Other licensing loopholes included allowing imports of HFCs for feedstock and other exempt uses without a license.

Under the revised F-gas Regulation, all HFC imports must be licenced and importers cannot exceed their quota. All HFC imports and exports must be presented to designated customs points which will have access to real time quota data facilitated by the customs single window environment platform.

Banning disposable cylinders

Disposable cylinders, which are widely used in the illegal ODS and HFC trade, have been banned in the EU since 2007. The new F-Gas Regulation has strengthened the previous placing-on-the-market ban to a complete use ban, which will significantly ease the enforcement challenge.

Efforts to crack down on disposable cylinders sales have driven some illegal traders to use cylinders which are technically refillable, but which the traders have no intention of using more than once.

To combat this problem the EU defines any containers that are imported or placed on the market without provision having been made for their return for refilling as 'non-refillable' and subject to the ban. Refillable cylinders containing HFCs and HFOs must be accompanied by evidence of a take-back scheme, which includes names of relevant parties, their commitment and relevant logistical arrangements.

All actors along the supply chain, from importers to distributors and onward sellers, are bound by this obligation.³⁷ If these conditions are not met by importers, customs are required to seize the containers and destroy the contents.³⁸

Improved customs controls, including transit

Weak regulation of HFCs in transit is a well-documented facilitator of illegal trade. To address this, the EU F-gas Regulation will require any undertaking using the transit procedure to be registered in the F-gas portal.³⁹

Additionally, HFCs can only be released for free circulation into the EU at designated customs offices. Opening and closing of transit procedures are also restricted to these locations. Controls at these customs' offices must be carried out by personnel familiar with the regulation and with access to suitable equipment to enable them to carry out relevant physical controls.⁴⁰

Carrying out checks on companies

The new Regulation now requires Member States to carry out checks on companies to establish that they are in compliance. Member States must adopt a risk-based approach and are required to act upon substantiated evidence received from third parties.⁴¹ The European Commission is tasked with promoting information exchange between competent authorities within Member States.⁴² Additional restrictions on new entrant companies which can apply for quota and the introduction of a quota fee are additional measures that should further deter illegal traders.

These new measures offer opportunities for much-needed cooperation, not just between countries, but between the multiple authorities (e.g. customs, tax authorities, police and environment ministries) involved within a country.

Above, left: The EU F-gas Regulation revision aims to improve enforcement to stop illegal imports.

Missed opportunities

Supply chain measures

As a single customs union shared by 27 Member States, the EU poses a unique enforcement challenge.

Despite some progressive measures, the revised Regulation fails to empower authorities to take action on non-quota HFCs for sale within the EU. Once placed on the single market, HFCs can travel around the EU with no requirement to demonstrate the quota associated with the HFC in question and there is no way for enforcement authorities to prove that the HFCs are quota compliant. Thus the majority of the compliance burden is placed on the first country of import, in particular those countries that border non-EU countries.

Developments in digital tracing methodologies mean it is feasible to use supply chain tracking to ensure that HFCs throughout the distribution network are quota compliant. This is already in place for a number of commodities, from tuna to beauty products,⁴³ and has been proposed in the United States for HFCs.⁴⁴ The revised F-gas Regulation does, however, empower the European Commission to amend the regulation to add tracing methodologies at a later date.⁴⁵

Penalties

Member States are required to set maximum administrative fines of at least five times the market value of the gases or products concerned under the revised regulation. In cases of repeat infringement, it must be at least eight times the value.⁴⁶

EIA believes the use of maximum fines is insufficient and Member States need to enact minimum fines and consider custodial sentences at a consistent level across the EU to ensure smugglers do not target countries with the weakest penalties. Lessons can be learnt from the success of Spain's Guardia Civil, which uses criminal, rather than administrative, penalties to ensure smugglers are sufficiently penalised.

Transparency

The EU F-gas Regulation now requires up-to-date information on quota-holders to be made public, but the size of the quota held by each company and company-by-company reporting is still confidential. In contrast, US regulations publish full details of annual quota holders and the quantity of quota they have and use.⁴⁷



Conclusions and recommendations

HFC climate crime remains an ongoing problem across Europe. Although it stops short of enacting much-needed HFC supply chain measures, the revised F-gas Regulation offers authorities a more robust toolbox to enable them to combat illegal trade; however, unless there is a concerted effort to build capacity and awareness of these new regulatory tools among Europe's enforcement community they will fail to deliver.

EIA investigations demonstrate that non-quota HFCs continue to enter the EU through border countries such as Bulgaria and Poland and are transported across the EU to countries such as Italy, Greece, Germany, France, Portugal and Spain. EIA investigations also highlight that smugglers are changing tactics, with some traders mis-declaring HFCs as HFOs.

As 2024 signals the next phase-down step in HFC supply under the EU F-gas Regulation, the incentives for criminals to illegally import HFCs will increase further. The need for coordinated pan-EU enforcement efforts to combat HFC illegal trade remains high.

As the EU embarks on an even swifter phase-out of HFCs, the UK risks being left behind. It is yet to revise its domestic F-gas regulation and there are indications that any revision will be light touch, with measures to combat illegal trade not foreseen. Unless the UK takes action to speed up the HFC phase-out and improve measures against illegal trade, it could become a dumping ground for the EU's unwanted high GWP HFCs and HFC-based equipment.

Ultimately, the illegal trade in HFCs is fuelled by ongoing demand for the gases, primarily for air-conditioning and refrigeration. There is an urgent need to find better ways to keep ourselves cool without the use of F-gases. Where cooling equipment is necessary, natural refrigerants offer a significantly more climate- and environment-friendly alternative. European governments, businesses and consumers have an important role to play in the purchasing choices they make.

- **EIA calls on the European Commission, enforcement authorities and all EU member governments to prioritise implementation of compliance related measures under the new F-Gas Regulation.**
- **The clear connection between non-quota compliant HFCs and tax evasion offers additional new avenues for prosecuting criminals involved in HFC climate crime. Environmental crime units should be empowered to carry out both financial and F-gas related investigations, in order to ensure maximum penalties are applied.**
- **The UK government must urgently revise the GB F-gas Regulation to align with the ambitious measures introduced in the EU.**
- **EIA urges European governments and businesses to build swift HFC exit plans into their net-zero strategies and implement measures, e.g. risk assessments, to ensure they do not purchase illegal HFCs. This includes online trading platforms and marketplaces, which need to play a proactive role in monitoring and removing adverts for suspected illegal HFCs.**
- **The European experience underpins the need to strengthen the Montreal Protocol to ensure it is fit to meet the challenges posed by the global HFC phase-down. Robust monitoring, reporting, verification and enforcement must be at the heart of implementation of the Kigali Amendment.**



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