





## ABOUT THE ENVIRONMENTAL INVESTIGATION AGENCY (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 reduce the impact of climate change by campaigning to eliminate powerful refrigerant greenhouse gases, exposing related illicit trade and improving energy efficiency in the cooling sector.

## OUR CLIMATE WORK

EIA has almost three decades of experience working with international bodies, governments and enforcement agencies and industry to reduce the environmental impacts of harmful refrigerant gases. Our pioneering investigations have shone a light on illegal trade in ozone-depleting substances (ODS) and hydrofluorocarbons (HFCs) across the globe. Our exposés and advocacy help increase awareness of illegal trade in ODS and HFCs and spur action to curtail it. 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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Above:  
The evidence points to significant illegal trade in HFCs in many parts of Europe since 2018.

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

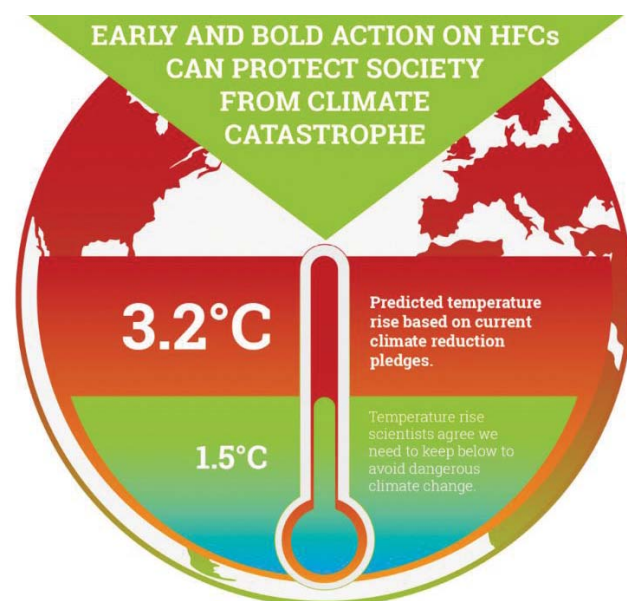
## Introduction

Despite a brief dip in carbon dioxide emissions caused by the COVID-19 pandemic, the world is still heading for a temperature rise in excess of 3°C this century, far beyond the universally recognised Paris Agreement target of 1.5°C.

To avert climate catastrophe, fast action is needed to reduce global CO<sub>2</sub> emissions by half by 2030 and to net zero no later than 2050, alongside deep cuts in non-CO<sub>2</sub> greenhouse gases (GHGs), such as hydrofluorocarbons (HFCs).<sup>1</sup>

HFCs are fluorochemical gases used primarily as refrigerants in air-conditioning, refrigeration and

**Below:** Global emissions are currently on track to overshoot the Paris Agreement target of 1.5°C.



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heat pumps, but also as blowing agents to manufacture insulation foams, as propellants in aerosols and as fire protection fluids and solvents. They are potent short-lived GHG with high global warming potentials (GWP), meaning they quickly exacerbate atmospheric warming when emitted.

Emissions from cooling are growing three times faster than the average rate of increase and are projected to account for 13 per cent of total GHGs by 2030.<sup>2</sup> Given the urgent need for emission reductions, cutting HFC use is one of the most effective tools to help prevent runaway climate change.

The need to address HFCs has long been recognised by the European Union (EU), which adopted the first F-Gas Regulation in 2006. In 2015, it was replaced by the current F-Gas Regulation, which introduced an economy-wide phase-down in HFC supply and several bans on HFC use in certain equipment and products, among other measures. The EU phase-down was swiftly followed in 2016 by an international agreement, the Kigali Amendment, to globally phase down HFCs under the Montreal Protocol.

As the EU approached the 37 per cent cut in HFC supply in 2018, prices of HFCs skyrocketed, reaching a peak of six to 13 times higher than the original price in 2015.<sup>3</sup> An illegal trade in HFCs quickly emerged, with smugglers able to purchase cheap HFCs outside the EU and sell them at a premium within the bloc by evading the phase-down quota system.



In 2019, EIA published a first report on the illegal trade of HFCs, *Doors Wide Open*, highlighting concerns at the ease with which companies could openly bring HFCs through customs without quota ('front door smuggling') and worrying trends of increased smuggling ('back door smuggling'). Since then, HFC climate crime

has come under increased scrutiny, with major enforcement efforts by the European Anti-Fraud Office (OLAF) working in collaboration with member states, resulting in several large HFC seizures during 2020. In contrast, there have been few seizures reported in the first half of 2021, despite the further HFC supply cut which took effect at the beginning of the year.

The F-Gas Regulation is now being reviewed in light of the European Green Deal and recently revised 2030 GHG reduction target of at least 55 per cent. The process offers a timely opportunity to address compliance and enforcement challenges relating to illegal trade in HFCs and to create a gold standard approach that can be mirrored by other nations around the world which are only just beginning their HFC phase-down.

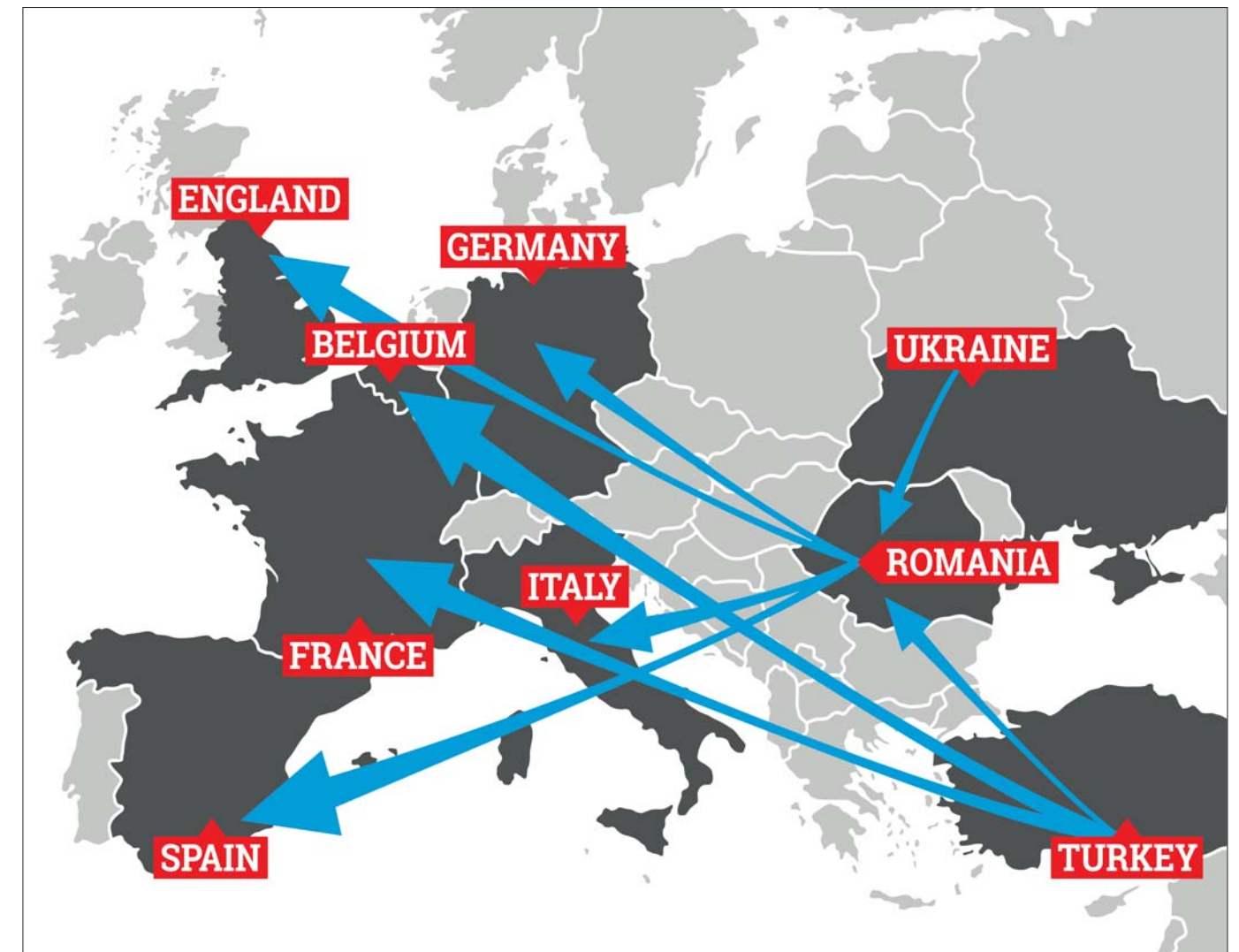
This report offers an update on the illegal HFC trade situation in Europe. It summarises information gathered from field and remote investigations, surveys of industry and government stakeholders as well as detailed trade and seizure data analysis.

## How does the HFC phase-down work?

The HFC phase-down is a stepwise decrease in carbon dioxide equivalent (CO<sub>2</sub>e) weighted HFC supply, with major reductions from the baseline of 37 per cent in 2018, 55 per cent in 2021 and 69 per cent in 2024. To legally place HFCs listed in Annex 1 of the F-Gas Regulation onto the EU market, an F-gas quota allocation is required.

Under the EU F-Gas Regulation, HFC quotas are allocated for free. Most of the quota (89 per cent) is allocated to 'incumbents', namely HFC producers, distributors and importers which have reported placing HFCs on the market during the previous three-year reporting period. The remaining HFC quota each year is divided evenly between new entrants. After three years, new entrants become incumbents.

The number of companies registering HFC imports is almost six times higher in the most recently reported data than at the start of the phase-down, with 282 bulk HFC importers in 2015 growing to 1,675 in 2019.<sup>4</sup> As a result, new entrants applying for quota for the first time in 2019 were estimated to receive an allocation of approximately 5,000 tonnes CO<sub>2</sub>e.<sup>5</sup> This equates to approximately 3.5 tonnes of HFC-134a (GWP 1,430) or 1.3 tonnes of HFC-404A (GWP 3,922). Any company may apply for quota or purchase it on the EU's F-gas registry portal, so long as it is registered. However, information on new entrants is not publicly available.



## EIA investigations

### Key findings

In 2020, EIA embarked on an undercover investigation to reveal the methods used to smuggle HFCs into the EU and identify some of the companies and individuals involved in the illegal trade.

After an initial scoping phase, it was decided to focus mainly on Romania, which has emerged as a key entry point into the EU for illicit HFCs. A list of companies was drawn up based on online adverts for HFCs by Romanian companies, especially those offering to supply refrigerants in disposable cylinders, which are prohibited in the EU.

EIA investigators posed as middlemen seeking to source five tonnes of HFC-134a for clients in Western Europe. Initial phone calls were made to representatives of the companies and, based on the response, follow-up meetings were arranged with companies willing to supply HFCs.

**Above:** Dutch seizure of HFC-134a cylinders.

The investigation revealed two key smuggling routes into Romania; directly from neighbouring Ukraine and from Turkey via Bulgaria. Close links were documented between Turkish and Romanian companies and individuals illegally trading HFCs. One method identified involves several companies in Romania collectively purchasing large consignments of HFCs sent from China to Turkey, which are then split up and moved into Romania, most likely via Bulgaria. An attempt to use this method was thwarted in July 2020 when Romanian customs intercepted 76 tonnes of HFCs which had been routed by truck from Turkey, destined for five companies in Romania, only one of which had an HFC quota.<sup>6</sup> Such sophisticated smuggling methods involve misuse of the EU's transit procedure (see Box *The Transit Loophole*).

EIA investigators also documented smuggling of HFCs in the region of Suceava, close to Romania's border with Ukraine. Meetings with individuals claiming to be experienced traders revealed routine bribery of border officials and the use of vans, refrigerated trucks and passenger coaches to transport consignments of HFCs.

In total, EIA investigators were offered 17.5 tonnes of suspected non-quota HFCs, with a global warming impact equivalent to 31,255 tonnes of CO<sub>2</sub>.

The investigations conducted in Romania confirmed the country's role as an important EU entry point for non-quota HFCs, but also as a transit country for HFCs destined for bigger markets such as Germany, Spain, Belgium, Italy, France and England. Engagement with the traders also revealed the existence of cross-border networks of companies and individuals encompassing Romania, Turkey and end markets such as Belgium and France, collaborating to traffic illicit HFCs.

Discussions with illegal HFC traders revealed the role of systematic corruption in facilitating large amounts of illegal HFCs to be imported from Ukraine; four traders targeted by EIA mentioned the use of bribes to customs officers, with payments of between €20-30 per cylinder.

EIA's investigations uncovered a growing trend of illegal HFC-404A in circulation, with one trader describing how the easy availability of cheap illegal HFC-404A undermined his plans to establish a refrigerant recovery business. HFC-404A is widely

**Above:** Potential trade routes for illegal HFCs entering the EU.

used in supermarket refrigeration systems; however, its very high GWP (3,922) led to a ban on topping up large refrigeration systems with this refrigerant under the F-Gas Regulation from January 2020 (known as the "service ban").<sup>7</sup> The composition of HFC seizures over time supports the claim that illegal imports of HFC-404A are growing (see Figure 19).

The findings indicate that enforcement efforts are impacting the way smugglers work. For example, some HFC traders were aware of enforcement efforts relating to the use of disposable cylinders and consequently shifted to trading in refillable cylinders and warning EIA investigators that disposable cylinders were more likely to be detected by enforcement officials. One trader claimed to no longer source HFCs from outside of Europe after having been fined for illegally importing, instead sourcing from within the EU. However, the ease with which EIA investigators located suspected illegal traders shows the scale of the illegal trade market.

Prior to publication, EIA has shared its findings from the investigations with the relevant enforcement agencies.

## Scoping studies

EIA initially carried out remote research to identify companies potentially engaged in trading illegal HFCs onto EU markets in Germany, Spain, Romania and Turkey. Investigators approached e-commerce companies and those offering HFCs via online trading platforms such as Alibaba, eBay, Milanuncios and OLX. Targets were selected using several criteria including displaying images of disposable cylinders, offering HFCs at low prices, offering shipping to various European countries and low transportation costs.

Despite being banned, some vendors on these trading platforms were displaying images of HFCs in disposable cylinders on sale for the EU market. One German company appeared to be selling HFC-404A in disposable cylinders in the packaging of a major HFC producer.

In addition to the presence of disposable cylinders, EIA's research uncovered vendors on Spanish trading platforms selling HFCs well below the HFC

tax-inclusive price of legitimate sellers. Spain introduced a GWP-weighted tax in 2014 to encourage a reduction in the use of high-GWP HFCs. According to industry stakeholders, the tax inclusive price of HFC-134a in Spain is approximately €40/kg. Yet EIA identified 18 vendors on Spanish trading platforms eBay and Milanuncios offering HFC-134a for below €20/kg.

Scoping work in Romania looking at sourcing HFCs in disposable cylinders revealed a significant number of e-commerce companies and trading platform vendors selling HFCs in disposable cylinders, with investigators able to source offers of 1,200 disposable cylinders over a short period of time.

## Field investigations: Romania

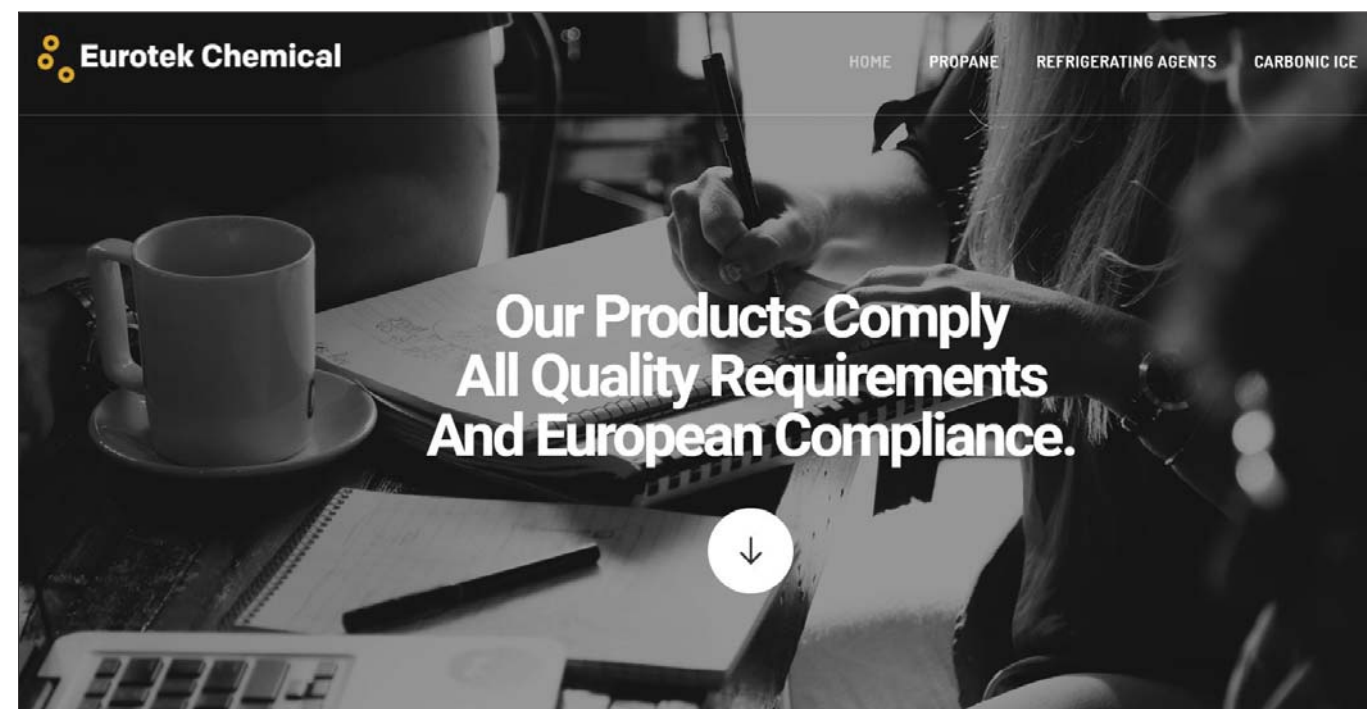
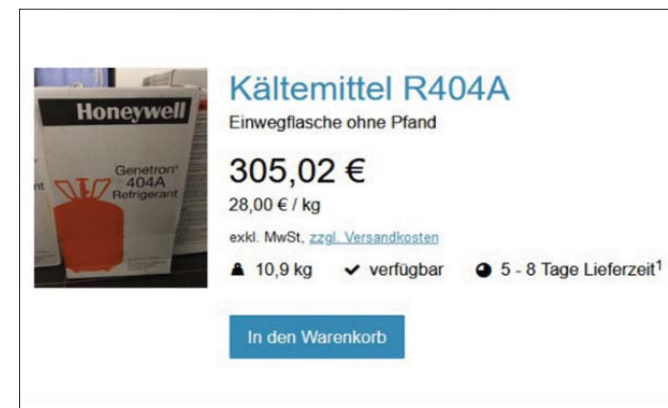
### Eurotek Chemical

EIA investigators met in Bucharest with George Dica, the Director of Eurotek Chemical, an online refrigerant sales company. Dica claimed to have more than 20 years' experience in the refrigerant industry and possessed detailed knowledge of the F-gas Regulation, including how to abuse the transit system to divert HFCs onto the black market.

Dica explained he deals in disposable cylinders of HFC-134a and HFC-404A, smuggled from Ukraine with the help of corrupt border guards. He was willing to issue an invoice for, and supply EIA investigators with, five tonnes of HFC-134a, explaining he could not bring it all in from Ukraine at once due to the risks involved.

**Left:** Screenshot of HFC-404A in disposable cylinders being sold online in Germany.

**Below:** Screenshot of Eurotek's website homepage.



He also offered to sell HCFC-22, an ozone-depleting refrigerant banned in the EU since 2010. Dica offered to connect EIA investigators with his associate who, he said, transports HFCs by van from Romania to France, Germany, Italy and Spain.

Dica highlighted huge black market demand for HFC-404A in Romania and Germany. He explained he had previously intended to work on recovering HFCs from commercial refrigeration systems for onward resale but said the easy availability of illegal HFCs from Ukraine meant no-one was interested in purchasing reclaimed HFCs.

### Frigotherm Expert

Frigotherm Expert, an air-conditioning installation company, was recommended to EIA investigators via a sales representative from a large international refrigeration company.

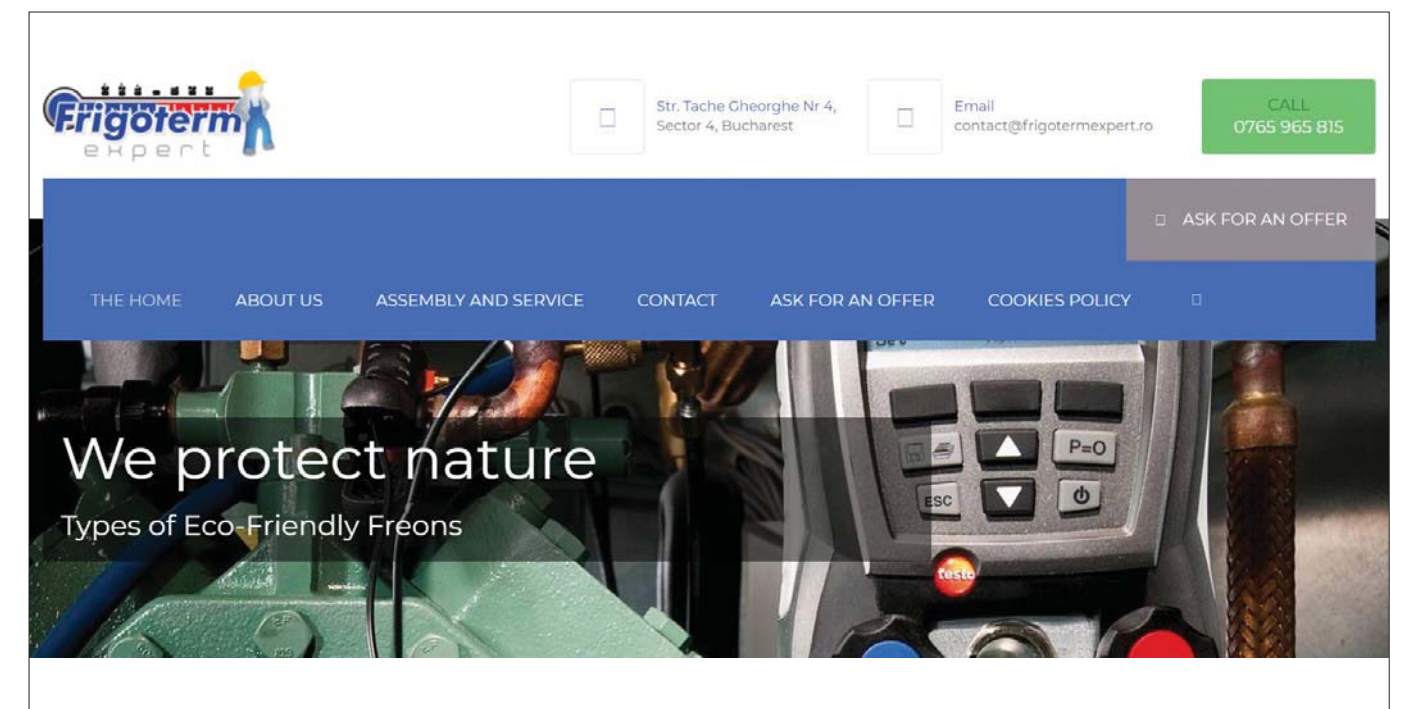
In July 2020, EIA met with company owner Ovidiu Neacsu, who claimed to source illegal HFCs in disposable cylinders from Turkey, saying his supplier had brought in dozens of tonnes of HFCs previously and he suspected his supplier was bribing border guards. At the time of EIA's meeting, Neacsu explained his supplier had a shipment of HFCs from Turkey detained at the border.

Neacsu appears to import HFCs in large tanks and spoke about how he pierces a hole in disposable cylinders to fill them up from the tank for onward sale. He also spoke about a Turkish associate who fills old refrigeration systems with HFCs to smuggle the HFCs into Germany. Neacsu also claimed he imported HFCs into Romania disguised in black plastic bags using Romanian firm Fan Courier.



**Above:** Covert footage taken by EIA investigators during meeting with Ovidiu Neacsu.

**Below:** Screenshot of Frigotherm's website homepage.



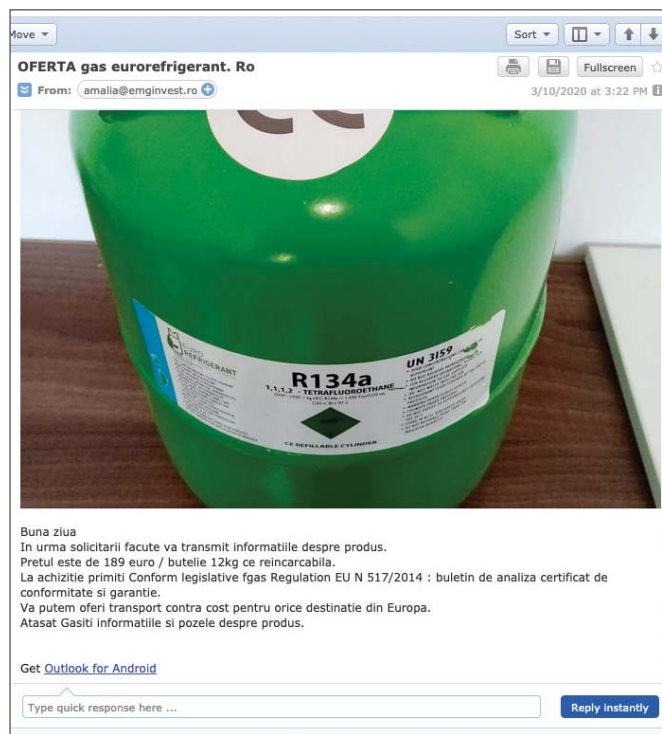


**EMG Management Invest (owner of Eurorefrigerant.ro)**

Eurorefrigerant.ro is an e-commerce website. EIA investigators used contact information on the site to call the company, requesting five tonnes of HFC-134a in disposable cylinders to be delivered to Germany. The representative was willing to offer this amount, claiming that despite being banned in Germany, the company could deal with disposable cylinders in Romania as there was no relevant Romanian law.

She followed up with images of disposable cylinders sent to EIA investigators via WhatsApp and a formal offer, featuring refillable cylinders, via email using an email address linked to a company called EMG Invest. EMG Management Invest was registered in 2019 and is a new-entrant HFC quota-holder.

In the biggest HFC seizure to date in June 2020, Romanian authorities seized 76 tonnes of HFCs (HFC-134a and HFC-404A), mostly in disposable cylinders. Investigators from the EU Anti-Fraud Office (OLAF) had monitored the shipment from China to Turkey, where the HFCs were removed from their container and re-routed via truck in several shipments to Romania.<sup>8</sup>



**Above:** Screenshots of communications with EMG offering HFCs in disposable cylinders to EIA investigators.

**Image 1 (clockwise from top):** "This is single use"

**Image 2:** "The price discussed 148 euro per item (cylinder) / For the single use cylinder the price is 550 RON" [550 RON is approximately 112 Euros]

**Image 3:** "Good day, following your request, I'm sending you the information about the product. The price is 189 euro / cylinder 12kg "ce" rechargeable. According to the legislation F-Gas Regulation EU N 517/2014, at the time of acquisition you will receive: bulletin of analysis, a warranty and conformity certificate. We can offer you transport for a fee for any destination in Europe. Attached, you'll find the information and photos of the product."



**Above:** Covert footage taken by EIA investigators during meetings with Cristi, Vasile Cernautan, and Stefan.

The customs documents revealed they were destined for five different consignees in Romania; four of them were not F-gas registered to receive imports of these gases, while the fifth would have significantly exceeded its quota for 2020 by receiving this shipment. Information received from Romania's Environmental Guard indicates that EMG Management Invest was the fifth consignee and its share of the import exceeded the company's quota.<sup>9</sup> The shipment of HFCs was subsequently returned to the sender in Turkey.

EIA investigators met EMG Management Invest representatives soon after the seizure took place, at which time they again confirmed they were able to supply five tonnes of HFC-134a. However, this time they were unwilling to supply the HFCs in disposable cylinders, stating that using them would involve jail penalties.

In response to a Right to Reply sent by EIA, a representative of EMG Management Invest wrote: "We had imported in June 2020, not illegally as we had the quota, but not sufficient for the quantity we imported." The representative also said: "I work under contract of import export with the Turkish company. I also represent them in Europe on F-gas. I do not see where the problem is as long as I have a contract with my Turkish provider."

**The Suceava route**

During meetings with traders in Bucharest, EIA investigators were informed that significant amounts of HFCs were available in the Suceava region, a northern province in Romania bordering Ukraine.

Investigators travelled to the region and arranged meetings with local traders advertising on the online trading platform OLX. Here investigators saw evidence of organised criminal involvement. For example, one trader known as Cristi arrived with a bodyguard and a falsely registered car, paranoid that EIA investigators were police. Later in the conversation he claimed to have large amounts of HFC-404A in stock and to have sold HFCs to a Turkish buyer based in Germany. Cristi appears to be a major buyer of HFCs as he was mentioned as a client by several smaller traders with whom EIA engaged.

Another HFC trader, Vasile Cernautan, claimed he had been under investigation by Romanian law enforcement and was no longer involved in smuggling goods across the border. Instead, he was now involved in purchasing smuggled HFCs already in Romania for onwards routing to Spain, claiming to have sent more than a tonne of HFCs to Spain on the day of EIA's meeting.

Cernautan was happy to supply investigators with five tonnes of HFC-134a and one tonne of HFC-404A in disposable cylinders and to organise onward transport to Germany. He explained this would be broken down into shipments of 1.5 tonnes per week, which would be

loaded onto passenger coaches travelling from Romania to Western Europe disguised as luggage in raffia or black bin bags. He was happy to guarantee delivery to destinations in Belgium, Spain and Germany and claimed to have sent HFCs to England in this way. He also stated HFCs were sometimes smuggled from Romania to other European countries hidden among food in refrigerated trucks.

EIA's final meeting in Suceava was with a trader named Stefan, who traded HFCs smuggled into Romania from Ukraine, explaining they were smuggled across the border in small, regular shipments. Stefan had more than half a tonne of HFC-404A in stock and said he was expecting more the following week. He only sold HFCs domestically, but offered to put EIA investigators in touch with an associate who sends HFCs onwards to Italy.

### Turkey to Central Europe

To further understand the role of EU border countries in illegal HFC smuggling, EIA contacted a range of Turkish HFC sellers, requesting HFCs for import into an EU member state. The findings revealed companies engaged in importing what appear to be non-quota HFCs to France and Belgium.

In early 2020, EIA investigators spoke with a Turkish refrigeration equipment company offering HFCs on Alibaba, requesting 600kg of HFC-134a in refillable cylinders to be imported to an EU destination. The investigators explained they had no HFC quota and the Turkish company suggested purchasing HFCs via one of its French customers, explaining it would send the HFCs to the French company for EIA to then purchase. The Turkish company representative warned that the cost of the HFCs would rise, claiming: "Because my client in France knew the status of European markets, he was buying from us for €150-160 and selling it in Europe for around €300-400 Euros in France." Follow-up conversations with the French client confirmed he could supply HFCs from the Turkish company. In a Right to Reply, the French client confirmed he was not listed on the HFC Registry and had no HFC quota allocation, but denied trading in HFCs.

### The Lima Group

The Lima Group is a Turkish trading company offering HFCs and car accessories for sale online.

In spring 2020, EIA investigators spoke to a representative of the Lima Group in Turkey, requesting 500kgs of HFCs to be shipped to an EU destination. The representative explained his stock had already been sent to Europe and suggested our investigator buy directly from his company in Belgium at the cost of €139 per 12kg refillable cylinder. He shared details of



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**Above:** Ten tonnes of HFC-404A seized by Dutch customs in September 2020 [Copyright Netherlands Human Environment and Transport Inspectorate (ILT)].

his company's Belgian representative, who confirmed he had a large stock of HFCs available for sale in Belgium, adding during a follow-up call he had recently sold HFCs to a German client.

In September 2020, Dutch authorities seized 10 tonnes of HFC-404A in a truck at Eindhoven, the Netherlands, which had been imported from Turkey and was destined for Belgium. The importer was not in the HFC Registry and did not have quota. The HFCs were incorrectly labelled and loaded and the driver of the vehicle did not have the required dangerous goods transport documents and certification. The goods were seized and the importer was fined storage, transport and processing costs.<sup>10</sup> Confidential sources indicate the importer was associated with the Lima Group.

In spring 2021, EIA investigators once again contacted the Belgian representative of the Lima Group, asking for HFCs to be delivered to a German address. The representative informed EIA he had been fined for importing HFCs without quota. As a result, he no longer directly imported, instead sourcing HFCs from companies in Germany and Spain.

## The transit loophole

The External Transit (T1) process allows for the temporary suspension of taxes, duties and commercial policy measures that are applicable on goods from outside the EU (non-Union goods) entering the EU. It allows the movement of goods under transit from their point of entry into the EU to their point of clearance to their final destination (either another EU member state or outside the EU).

The Transit Accompanying Document (TAD) does not require an HS commodity code and the consignee does not need to be F-gas registered. Misuse of the T1 transit procedure typically involves 'opening' and 'closing' transits several times to confuse the trail of HFCs, enabling them to be diverted onto the black market.

Dutch enforcement authorities have highlighted this as a major method used to route non-quota HFCs to Western European destinations, evidenced by a seizure of 14 tonnes of HFCs in disposable cylinders at Rotterdam in July 2020. The HFCs,



**Above:** The T1 process is being misused to bring HFCs onto the European market illegally.

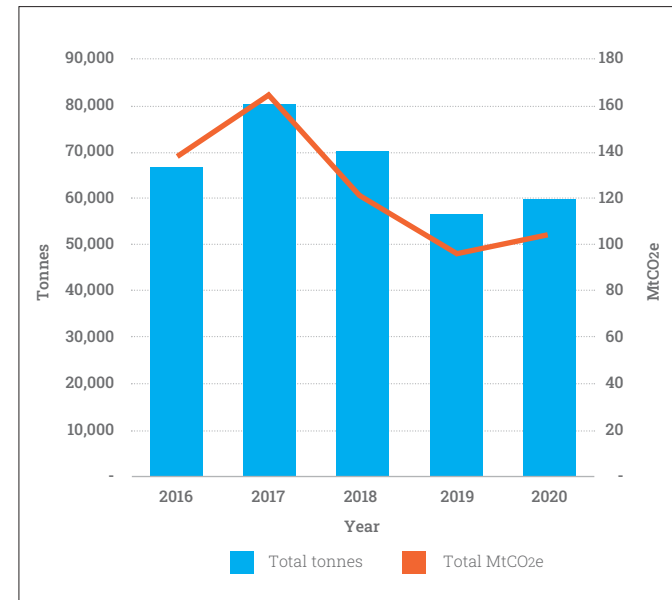
shipped from China, entered Europe through the German port of Hamburg and were declared in transit westwards to Rotterdam, but with a final destination in Lithuania.

Investigations revealed the shipment was actually destined for Poland. Cooperation between OLAF and the authorities in the Netherlands, Lithuania and Poland enabled the shipment to be seized in Rotterdam.<sup>11</sup>

# HFC customs data analysis

EIA utilised HFC customs data from Europe (Eurostat) to examine the trade in bulk HFCs from 2016-20 and to compare EU-reported HFC imports and exports to company-reported HFC Registry data published by the European Environment Agency (EEA). UK imports and exports in 2020 were sourced from UK Trade Info and added to EU27 data available from Eurostat.

Figure 1: HFC bulk imports into EU28



The analysis is relatively complex due to the range of codes used by the international Harmonised System (HS) and European Combined Nomenclature (CN) system. At the international level, six-digit HS codes 290339 and 382478 are used to cover all HFCs and some other chemicals. Under the CN system, two additional digits allow distinct codes for widely used HFCs and HFC blends. HS code 290339 covers fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons, with individual CN codes for HFC-32, HFC-23, HFC-125 and HFC-143a, HFC-152a, HFC-134a, HFC-1234yf and HFC-1234ze. HS code 382478 covers mixtures containing perfluorocarbons (PFCs) and HFCs (but not containing CFCs or HCFCs), with individual CN codes for HFC-507A, HFC-404A, HFC-410A and HFC-407C and grouped codes for other HFC and PFC blends.

## HFC bulk imports and exports

Figure 1 details bulk imports of HFCs into the EU from 2016-20. After falling year-on-year since 2017, bulk imports of HFCs into the EU increased in 2020, both in overall tonnage and estimated CO<sub>2</sub> equivalent tonnage. This increase in imports and the GWP of the HFCs being imported runs counter to the overall trend of the F-Gas Regulation.

HFC exports from EU28 also slightly increased in 2020 but were at comparable levels to earlier years (see Figure 2). The average GWP of HFC exports from the EU has steadily increased, from 1,818 in 2016 to 2,098 in 2020.

## Comparison of HFC trade data with reported data under the HFC Registry

In 2018 and 2019, imports according to customs data were 5-8 per cent higher than HFC imports reported to the HFC Registry, by 3,437 tonnes in 2018 and 4,207 tonnes in 2019 (see Figure 3). The discrepancies increase to 7-11 per cent of reported figures on a CO<sub>2</sub>e basis, a difference of 8.2 MtCO<sub>2</sub>e in 2018 and 9.1 MtCO<sub>2</sub>e in 2019. While there are margins of error associated with the complex CO<sub>2</sub>e calculation, one would expect the more straightforward tonnage figures to match more closely. These discrepancies indicate continued front door smuggling of HFCs in 2018 and 2019.

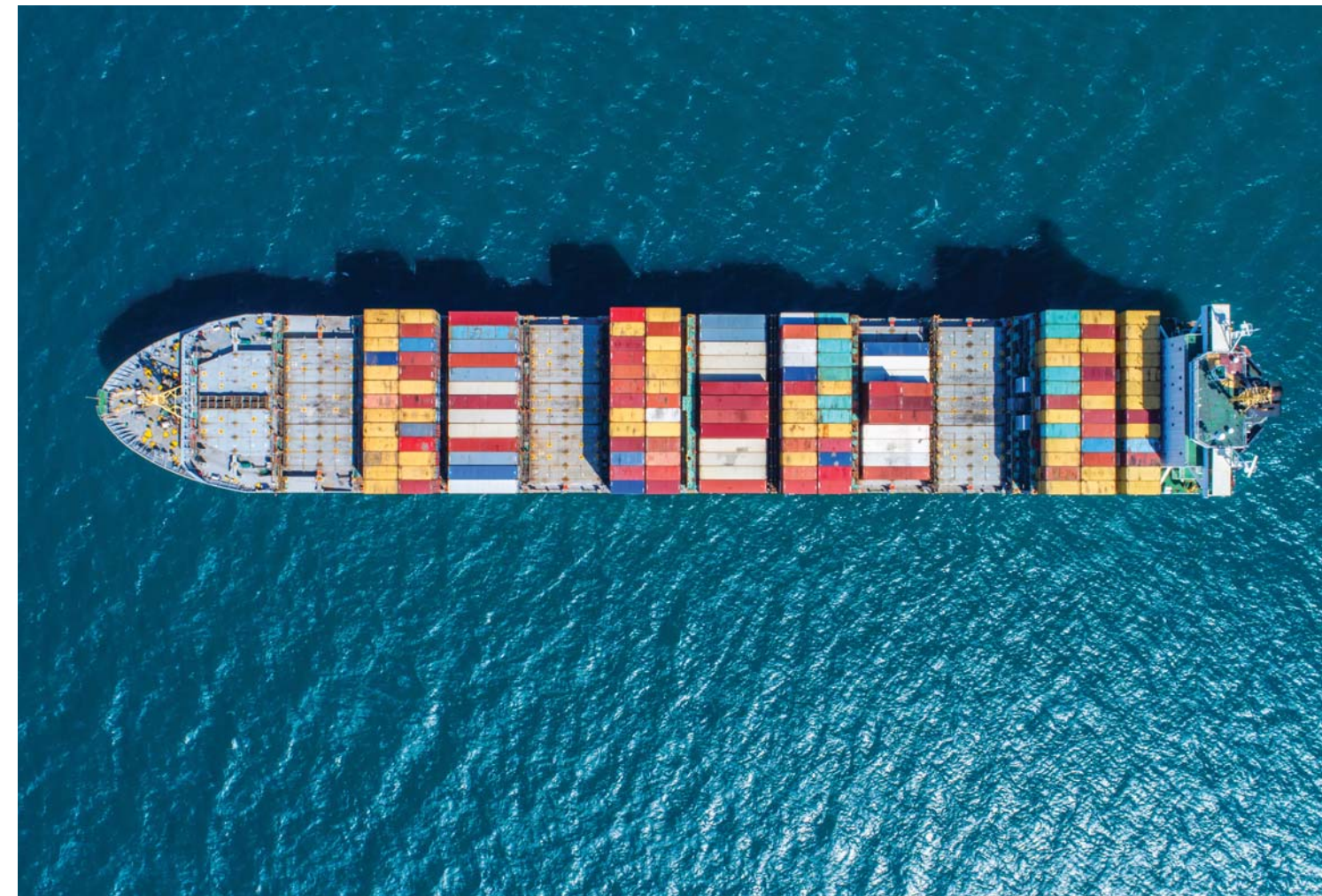
	HFC imports (tonnes)	HFC imports (MtCO <sub>2</sub> e)	Average GWP of imported HFCs
2016	66,405	138.7	2,089
2017	80,440	164.2	2,041
2018	70,589	120.1	1,702
2019	56,527	95.5	1,690
2020	59,645	104.3	1,749

Source Eurostat and UK Trade Info

Figure 2: HFC bulk exports from EU28

	HFC exports (tonnes)	HFC exports (MtCO <sub>2</sub> e)	Average GWP of exported HFCs
2016	24,144	43.9	1,818
2017	24,321	47.8	1,965
2018	24,319	48.1	1,978
2019	22,058	43.9	1,992
2020	23,965	50.3	2,098

Source Eurostat and UK Trade Info



Above: Trade data discrepancies indicate continued front door HFC smuggling.

Figure 3: Comparison of HFC import trade data with reported data under the HFC Registry

	HFC imports (tonnes)			HFC imports (MtCO <sub>2</sub> e)		
	HFC Registry	European customs	Difference	HFC Registry	European customs	Difference
2016	68,971	66,405	-2,566	142.3	138.7	-3.6
2017	79,577	80,440	863	154.1	164.2	10.1
2018	67,152	70,589	3,437	111.9	120.1	8.2
2019	52,320	56,527	4,207	86.4	95.5	9.1

Source: Eurostat and EEA

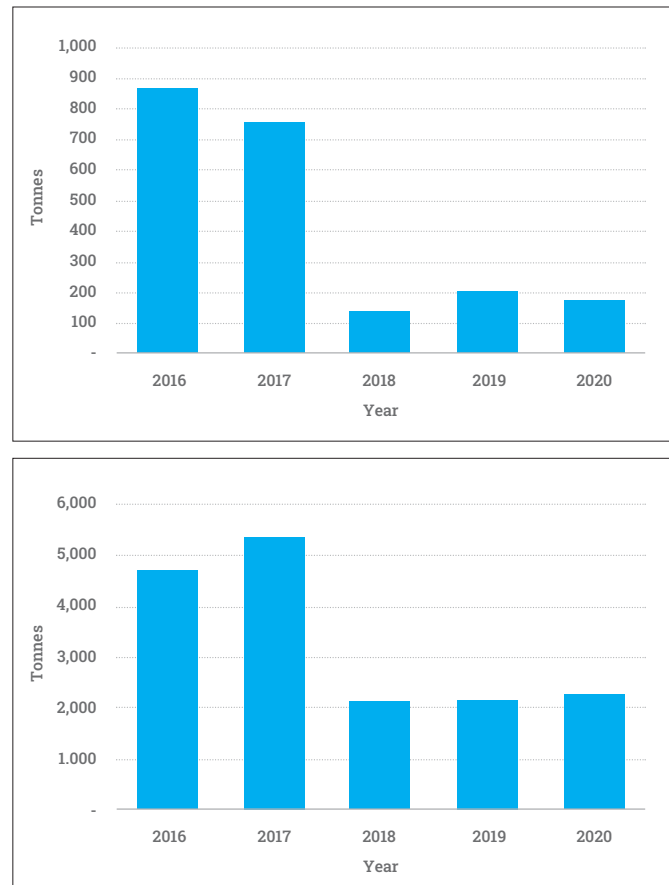
Figure 4: Comparison of HFC export trade data with reported data under the HFC Registry

	HFC exports (tonnes)			HFC exports (MtCO <sub>2</sub> e)		
	HFC Registry	European customs	Difference	HFC Registry	European customs	Difference
2016	27,414	24,144	-3,270	50.7	43.9	-6.8
2017	29,224	24,321	-4,904	50.9	47.8	-3.1
2018	26,039	24,319	-1,720	43.2	48.1	4.9
2019	22,475	22,058	-417	37.6	43.9	6.3

Source: Eurostat and EEA

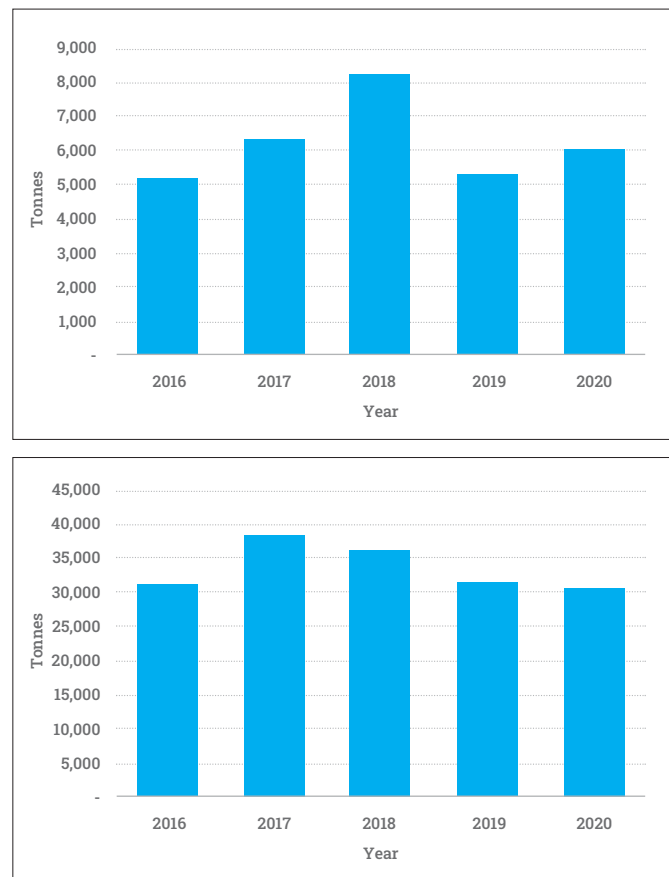


**Figure 5:** Bulk imports to EU28 of HFC-507A [top] and HFC-404A [below]



Source: Eurostat

**Figure 6:** Bulk imports to EU28 of HFC-410A [top] and HFC-134a [below]



Source: Eurostat

HFC exports according to customs data are generally lower than the amounts reported to the HFC Registry; however, the data is more closely aligned in 2018 and 2019 (see Figure 4). Estimated CO<sub>2</sub>e HFC exports in 2018 and 2019 were higher when calculated by customs data than those reported to the HFC Registry.

**Refrigerant trends according to import data**

The impact of the HFC phase-down is clearly seen in the trend in imports of specific HFCs.

Imports of very-high GWP refrigerants HFC-507A (GWP 3,985) and HFC-404A (GWP 3,922) dropped significantly in 2018, when the 37 per cent quota cut took effect (see Figure 5). However, given the 2020 ban on servicing larger refrigeration systems with high-GWP HFCs, it is surprising that imports of HFC-404A increased, albeit slightly, in 2020.

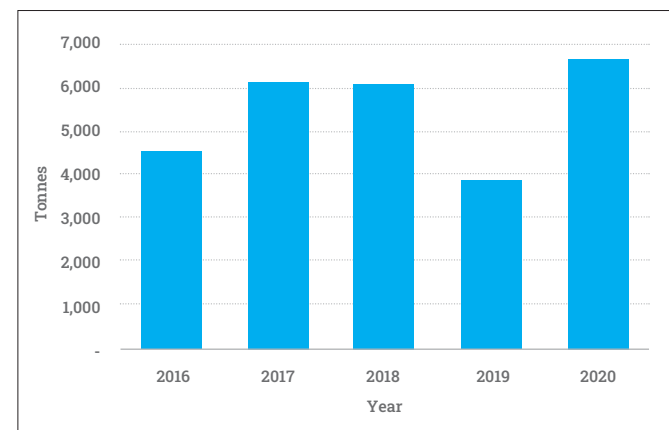
Imports of high-GWP refrigerants HFC-410A (GWP 2,088) and HFC-134a (GWP 1,430) in 2020 were at similar levels to 2016 imports, indicating ongoing high demand. Bulk imports of medium-GWP HFC-32 (GWP 675) have generally increased since 2016, despite a dip in imports in 2019.

**Indications of illegal trade entry points and source countries**

The illegal trade by its very nature is difficult to quantify, however indications of the scale of illegal trade can be gleaned from trade data anomalies.

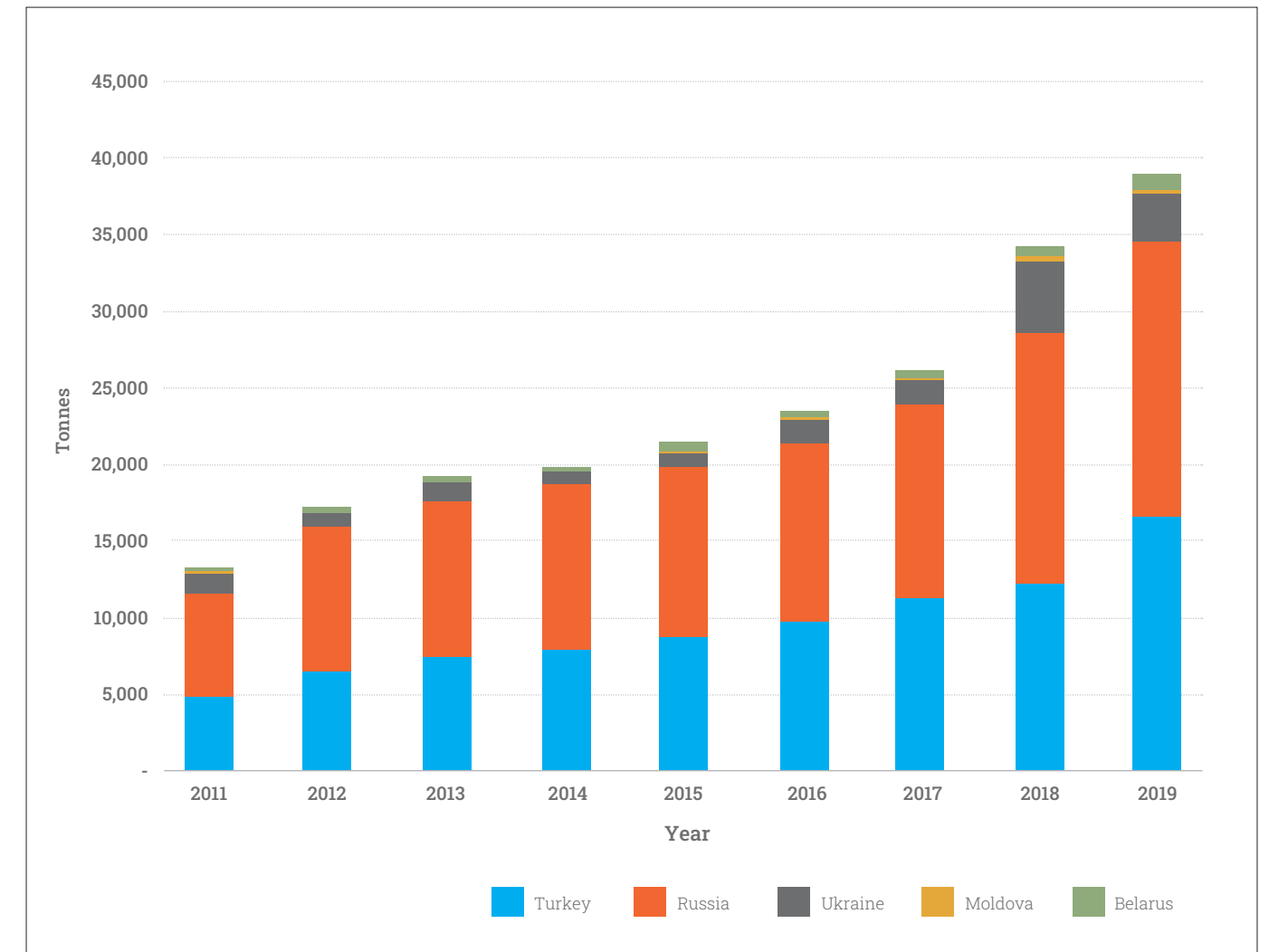
In the case of the F-Gas Regulation, the requirements are entirely on those companies placing HFCs on the market in the EU. Article 2 of the F-Gas Regulation defines 'placing on the market' as "supplying or making available to another party in the Union for the first time, for payment or free of charge, or using for its own account in the case of a producer, and includes customs release for free circulation in the EU."

**Figure 7:** Bulk imports to EU28 of HFC-32



Source: Eurostat

**Figure 8:** EU neighbouring countries reported HFC imports from China



Source: UNComtrade

Importers attempting to place non-quota HFCs on the market may under-report or avoid reporting HFC imports while the data reported by the exporting country is potentially more accurate, given that the exporter has no legal requirements under the F-Gas Regulation and therefore no reason to avoid reporting or misreport.

**Turkey HFC exports to the EU**

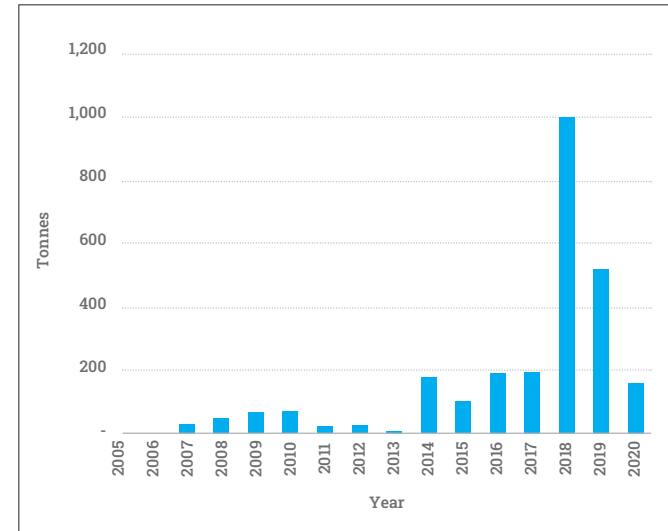
China HFC exports to eastern EU neighbouring countries, several of which have been identified as likely source countries for HFCs entering the EU illegally, have grown by 96 per cent since 2014 (see Figure 8).

Turkey has emerged as a key source country for Chinese-made HFCs entering the EU without quota. European customs import data indicates that between 2007-13, on average 38 tonnes of HFCs were imported to the 28 member states from Turkey each year. EU reported HFC imports from Turkey began to grow in 2014, peaking at 1,002 tonnes in 2018, the year that a significant illegal HFC trade emerged (see Figure 9). Romania, France, Italy, Greece and Hungary received 69 per cent of the imports that year.

Export data reported by Turkey suggests substantially higher exports to the EU. The significant discrepancies between European customs HFC import data and Turkish HFC export data have steadily increased since 2016. In 2020, the EU reported imports of 160 tonnes of HFCs from Turkey, while Turkey reported exports to the EU of 706 tonnes of HFCs to the EU, more than four times higher. These discrepancies indicate significant quantities of undeclared HFCs are entering the EU from Turkey.

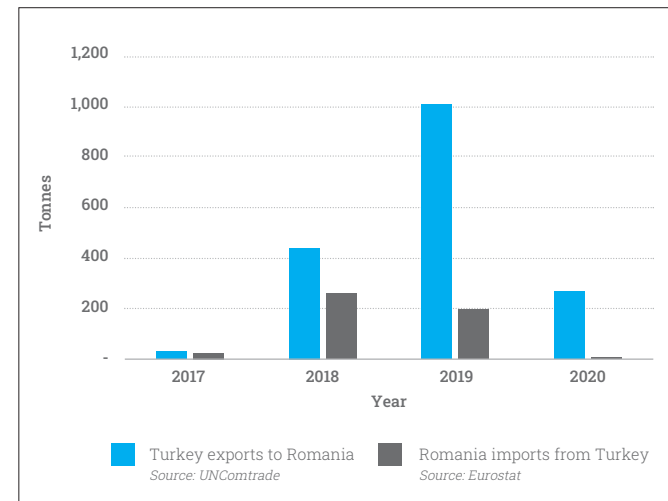
China HFC exports to eastern EU neighbouring countries, several of which have been identified as likely source countries for HFCs entering the EU illegally, have grown by 96 per cent since 2014

**Figure 9:** EU reported imports of HFCs into EU28 from Turkey

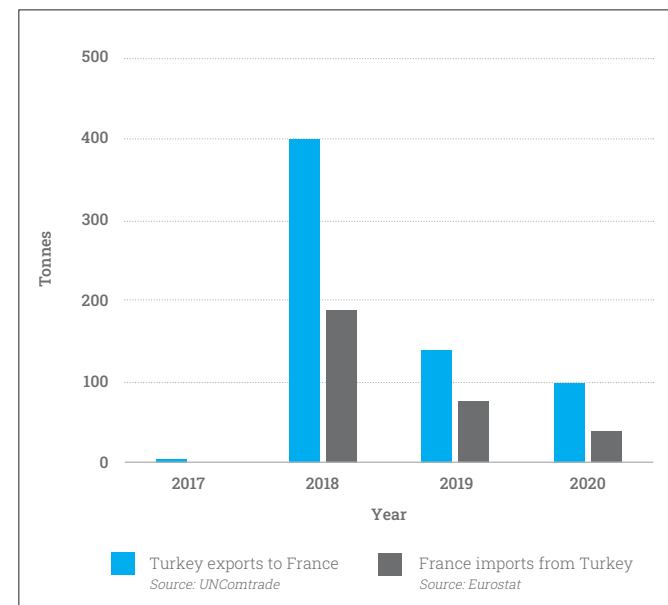


Source: Eurostat

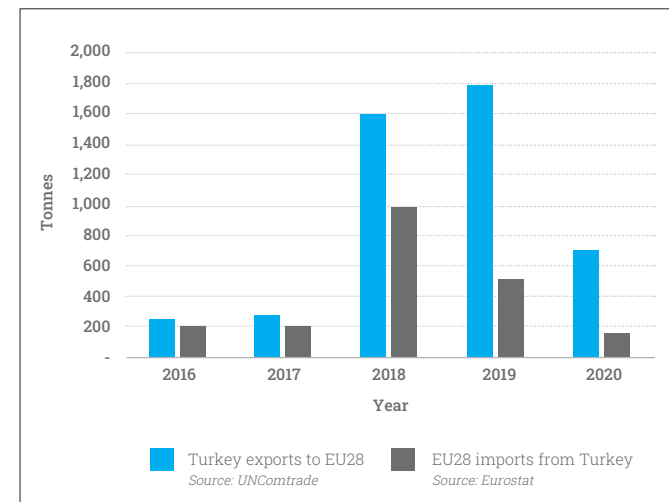
**Figure 11:** Difference between Turkey reported HFC exports to Romania and Romanian reported HFC imports from Turkey



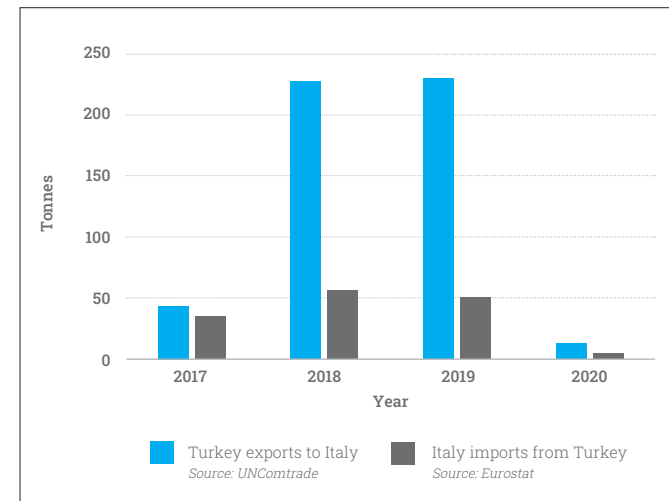
**Figure 13:** Difference between Turkey-reported HFC exports to France and France-reported HFC imports from Turkey



**Figure 10:** Difference between Turkey reported HFC exports to EU28 and EU28 reported HFC imports from Turkey



**Figure 12:** Difference between Turkey-reported HFC exports to Italy and Italian-reported HFC imports from Turkey



Looking at the trade between Turkey and Romania, discrepancies are even more apparent, supporting EIA's investigations which point to Romania's role as an important entry point for non-quota HFCs entering from Turkey.

The trade data shows Romania has become Turkey's largest EU export destination, receiving 53 per cent of total Turkey exports to the EU in 2019 and 39 per cent in 2020 (up from 28 per cent in 2018). Turkey-reported HFC exports to Romania are consistently higher than Romanian customs HFC import data (see Figure 11). In 2020, Turkey reported exports of 276 tonnes to Romania, while Romanian import data reports just 9.2 tonnes – a difference of almost 3,000 per cent. Similar trade data discrepancies exist between Turkey and Italy (see Figure 12) and Turkey and France (see Figure 13)

**Figure 14:** Difference between China-reported exports of HFCs to EU (Source: China customs data) and EU-reported imports from China (Source: Eurostat)

	2016	2017	2018	2019	2020
EU reported HFC imports from China (tonnes)	51,859	67,820	54,955	43,777	42,902
Chinese reported HFC exports to EU (tonnes)	57,735	70,023	120,751	46,671	48,678
Difference between European and Chinese customs data (tonnes)	5,876	2,203	65,796	2,894	5,776
Percentage difference between European customs and Chinese customs data	11%	3%	54%	7%	13%

### China HFC exports to the EU

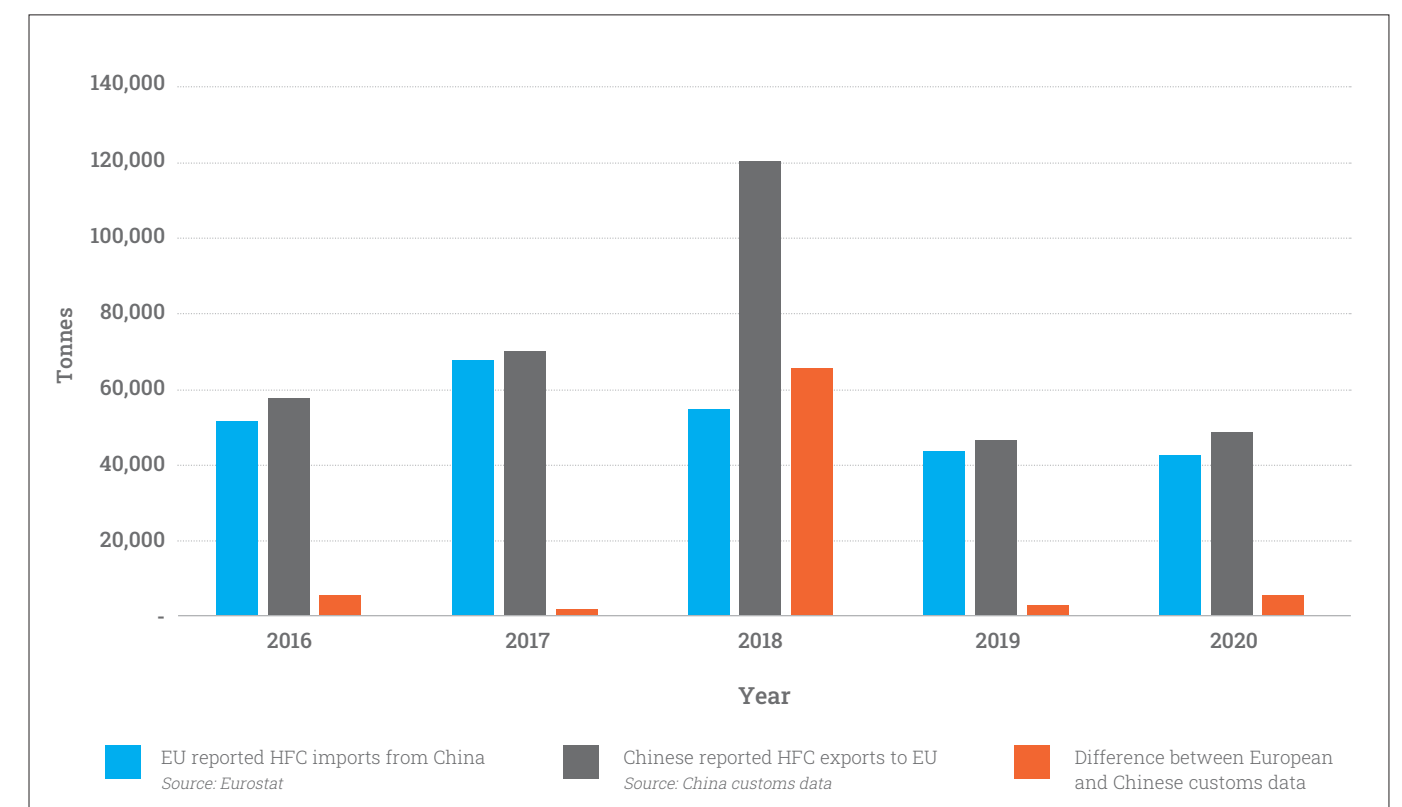
Similar discrepancies are found between Chinese and European reported trade data for HS codes 290339 and 382478, with China-reported exports consistently higher than EU-reported imports (see Figure 14 and Figure 15). The difference between the two datasets is particularly significant in 2018, with China reporting exports of more than twice the amount reported by the EU.

The percentage difference between the two trade data sets decreased in 2019 but rose again in 2020 to 13 per cent. European-reported imports to the

Netherlands, the largest trading partner, were 2,666 tonnes lower than China-reported exports in 2020. UK-reported imports were 817 tonnes lower and Germany 548 tonnes lower than China-reported exports. The discrepancy was also significant in Greece, Croatia, Lithuania and Latvia, with China-reported exports three to six times higher than European-reported imports.

EIA acknowledges the need for caution in drawing conclusions from customs data comparisons, however the data clearly reinforces the understanding that 2018 was a key year for the illegal import of HFCs into the EU.

**Figure 15:** Difference between China reported exports and EU reported imports



# Industry survey

In March 2021, EIA surveyed a range of heating, ventilation, air-conditioning and refrigeration (HVACR) industry representatives, including industry and contractor associations, refrigerant suppliers, equipment producers and distributors and end users.

The survey gathered views and experiences of the EU F-Gas Regulation, including the HFC illegal trade, and provided an opportunity to compare responses with a similar survey EIA conducted in 2018. Thirty responses were received from companies and individuals in 12 EU Member States.

In general, the responses indicated a positive trend in the implementation and enforcement of the F-Gas Regulation since the 2018 survey (see Figure 16). For example, 66 per cent of respondents stated they were aware of or suspected illegal trade of HFCs in 2021, compared to 83 per cent in 2018. When asked whether there had been a change in the amount of illegal HFC used or traded in the EU during the past two years, responses were mixed: 33 per cent of respondents felt there had been an increase, 23 per cent thought there had been a reduction, 13 per cent thought there was no change and 30 per cent did not know or had not noticed.

Respondents stated that HFC-134a and HFC-404A are the refrigerants most connected to illegal trade and also mentioned HCFC-22, HFC-410A and HFC-507. One respondent raised concerns about virgin HFC-404A being labelled as reclaimed product; this issue could become more pressing due to the 2020 service ban on virgin high-GWP HFCs in large refrigeration equipment.

Despite anecdotal evidence that disposable cylinders are being used less frequently or less blatantly than in 2018, the use of disposables is still evident. A total of 37 per cent of respondents stated they had been offered disposable cylinders or had seen them in use (compared to 72 per cent of respondents to the 2018 survey). These responses came from companies or individuals in Italy, Greece, Sweden, Finland, the Netherlands, Spain, Belgium and Bulgaria, showing the issue is widespread.

Refrigerant supply issues seem to have significantly reduced since 2018, with only 13 per cent of respondents experiencing HFC supply problems in the past year compared to 67 per cent in 2018. The supply issues experienced mostly concerned very high-GWP refrigerants such as HFC-404A, as well as some HFC and HFO blends; 90 per cent of the respondents stated there was adequate supply or usually adequate supply of affordable low-GWP alternatives.

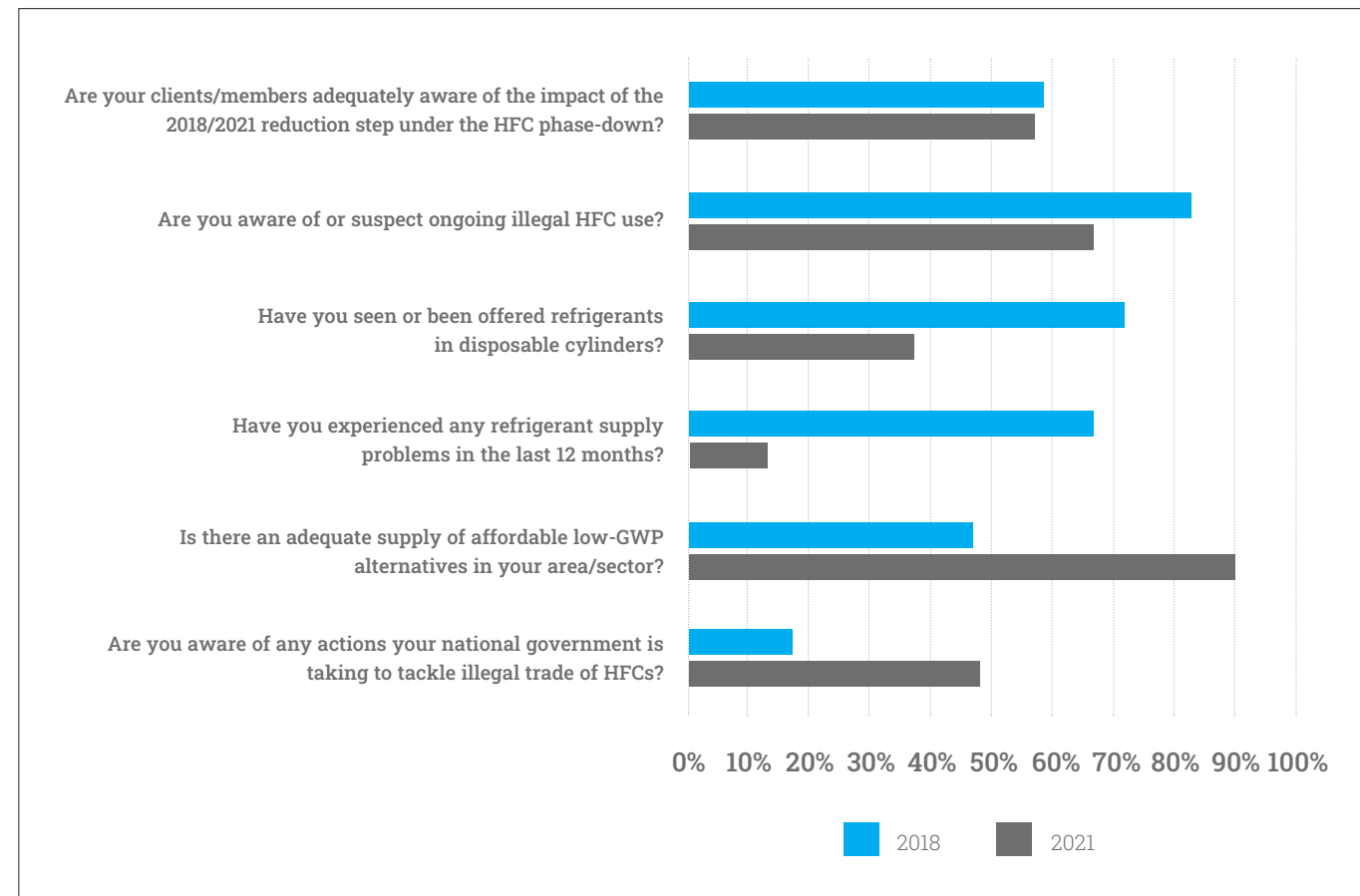
About half the respondents were aware of government actions to tackle illegal trade in the countries they work in, significantly more than the previous survey. When asked about potential changes to the F-Gas Regulation to reduce illegal trade, the top choice was to strengthen controls and monitoring of HFCs in transit (33 per cent) followed by: issuing proportionate penalties (27 per cent), banning the use of disposable cylinders (23 per cent) and removing the exemption for importers of less than 100MtCO<sub>2</sub>e (14 per cent). No respondents felt that no changes were needed.

EIA also asked industry stakeholders what more their governments should do to ensure compliance with the EU F-Gas Regulation. The most popular answers were improving border controls and carrying out market surveillance. Other suggestions included: increasing traceability of HFCs, via documents linking purchased HFCs to respective quota; closer checking of companies selling HFCs; establishment of clearer rules and systems; and higher penalties for illegal trade of HFCs.

Respondents stated that HFC-134a and HFC-404A are the refrigerants most connected to illegal trade and also mentioned HCFC-22, HFC-410A and HFC-507.

**Below:** The use of disposables is still evident, with 37 per cent of respondents stating they have been offered disposable cylinders or seen them in use.

Figure 16: Industry stakeholder responses to questions regarding illegal HFC trade.



# EU member state survey

In April 2021, EIA contacted EU member states and the UK, requesting information on measures taken and challenges to enforce the F-Gas Regulation. Nineteen responses were received from the following countries: Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Luxembourg, Malta, the Netherlands, Poland, Romania, Spain, Sweden and the UK. The responses demonstrate that many Member States are taking significant steps to improve enforcement of the F-Gas Regulation, but multiple challenges remain.

A number of member states (Bulgaria, Czech Republic, Estonia and Germany) are in the process of revising and amending national legislation to improve implementation and enforcement of the F-Gas Regulation. These include measures to address compliance along the supply chain, for example on transport, storage and use of non-refillable containers.

In 2019, a market survey of car repair shops carried out by the regional government of Hessen, in Germany, estimated that approximately 25 per cent of HFC-134a used in the region was illegal. The study highlighted low levels of quota traceability in the HFC-134a supply chain driven by a lack of legal obligation; 68 per cent of respondents were not aware of whether the gas they purchased was associated with quota or not.<sup>12</sup> A recent amendment to Germany's Chemical Act, requiring all supply chain players to provide documentation proving HFCs have associated quota, is expected to help address this.<sup>13</sup>

**Below:** Member States report challenges in imposing penalties for illegally importing HFCs into the EU including issuing fines.



Other measures being undertaken by member states to tackle the illegal trade of HFCs include:

- organising and attending training and awareness raising workshops, including participation in a January 2020 customs workshop organised by OLAF;
- raising awareness among customs officers and the wider industry;
- risk profiling;
- market surveillance, in particular online sales; Sweden noted that a meeting with Facebook had enabled illegal sales of F-gases on Facebook marketplace to be addressed more quickly than previously.

Eight member states reported undertaking administrative, civil or criminal procedures related to enforcement of the F-Gas Regulation in 2019 and 2020. Only four – Belgium, the Czech Republic, Hungary and Sweden – reported penalties, ranging from €488 to about €133,000. Hungary imposed the €133,000 (Ft47.316.600) fine on a company that attempted to place 423 non-refillable HFC-134a cylinders on the EU market in 2019. Belgium issued administrative penalties in 66 cases, with penalties from €4,000-54,000. Estonia initiated a number of procedures but noted that enforcement procedures did not often reach financial penalties as those subject to the procedures were often citizens of countries outside its jurisdiction and able to evade the procedure. Malta noted that although shipments of illegal refrigerants had been stopped at its border, no prosecution was possible as they had not yet been placed on the market. The UK also reported returning a number of HFC shipments to origin with no fines imposed, including six tonnes of non-quota HFC-404A arriving by ship from Turkey.

## Challenges to enforcement

Many member states noted that the definition of 'placing on the market' posed enforcement challenges, due to the lack of legal responsibility further down the supply chain once refrigerants had been placed on the market for the first time, potentially in a different country. Hungary noted 'release for free circulation' under the Union Customs Code and 'placing on the market' under the F-Gas Regulation were often divided in time and thus difficult to effectively control.

The T1 transit procedure was raised by the Netherlands, Belgium, the Czech Republic, Spain and Denmark as a challenge for enforcement. The Netherlands noted importing companies can easily decide to opt for another routing and that the recovery of costs is difficult when the destination country is not the same as where goods are declared for import.

Bulgaria, Denmark, Ireland, Finland and Germany mentioned challenges related to online selling platforms; for example, whether online platforms could be compelled to remove adverts for illegal HFC sales, verifying whether illegal e-commerce falls under the placing on the market restriction and enforcement challenges when internet retailers run their website on a server outside of the EU.

Finland referred to difficulties in verifying whether companies selling refillable cylinders have an adequate return system and legal difficulties in confiscating non-refillable cylinders.

Germany and the UK stated there were enforcement challenges surrounding checking the quota obligation due to the 100tCO<sub>2</sub>e exemption, as multiple imports below this threshold by an importer cannot be ruled out nor can the possibility of quota transfers before the end of the year.

Poland noted that entities in the F-gas Portal are not identifiable by the Economic Operators Registration and Identification (EORI) Number, which is the main identifier of operators for customs. Hungary and the UK highlighted challenges in controlling pre-charged equipment, as only the Combined Nomenclature (CN) code of the equipment, not the gas, is shown in the Special Administrative Document (SAD), thus requiring customs officials to scrutinise further paperwork to verify the contained gas. The UK also noted challenges in tracking the intended use of imported HFCs, particularly in respect of importers of exempt goods and re-exports by same importer.

The lack of real-time monitoring of HFCs under the current reporting system was only mentioned by one country, likely due to broad acceptance that this will be addressed in future through the Single Window Environment for Customs.

## Dealing with seized refrigerants

Eight member states stated that they destroy seized refrigerants, although there are problems associated with this due to the costs involved. Six countries stated they send seized shipments back to the exporting country, while three stored them with the intention of destroying them in the future (Belgium), until a procedure for destruction or recycling is established (Greece) or because it had no destruction facility (Cyprus). Estonia was the only member state setting up an auctioning system alongside a reclamation system. Some countries have questioned the feasibility of an auctioning system due to the lack of legitimate market for high-GWP gases.



**Top:** Screenshot of refrigerants in disposable cylinders for sale which can be found on online marketplaces in many EU member states.

**Above:** Image from a Polish HFC seizure in 2019.

# Analysis of HFC seizure data

EIA collated available refrigerant seizure data from news reports, data submitted to the Montreal Protocol and direct communications with EU member states.

The number of member states carrying out seizures and the amount of HFCs seized has increased year-on-year since 2018, reflecting increased enforcement efforts (see Figure 17).

In 2018, 118 tonnes of HFCs were seized in 97 separate seizures in six member states. Based on the GWP of the HFC seized, the seizures had a climate impact equivalent to approximately 200,000 CO<sub>2</sub>e tonnes. Eighty-six of the seizures were small amounts seized in Bulgaria while 95 per cent of the total weight was seized in Poland.

In 2019, 220 tonnes (approx. 400,000 CO<sub>2</sub>e tonnes) of refrigerants were seized in 104 seizures in 10 member states. Seventy of these were small seizures of one or two cylinders of HFCs in Lithuania and, again, the majority (54 per cent) of the total weight was seized in Poland.

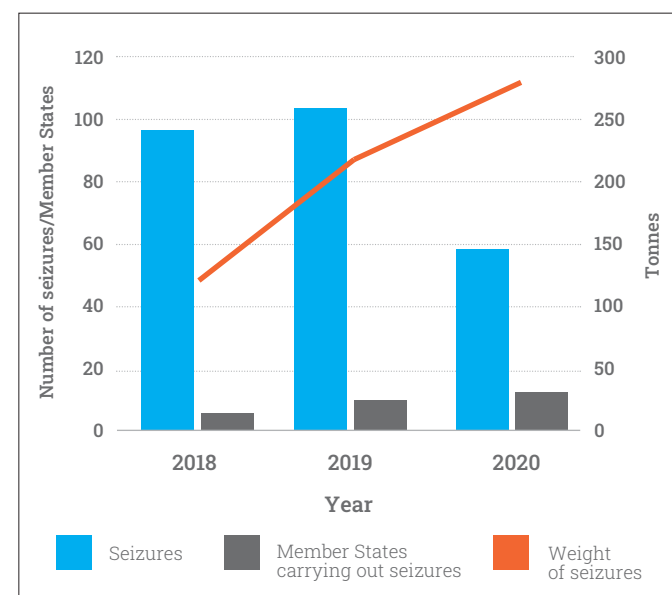
In 2020, there were 59 seizures reported in 12 EU member states. In total, 281 tonnes of refrigerants, with a climate impact equivalent to 700,000 tonnes CO<sub>2</sub>, were seized. Although the number of seizures in 2020 was lower than in 2019, more member states reported seizures and the total amount of seized HFCs by weight has increased each year since 2017.

The size of individual seizures has also increased, with seizures greater than 10 tonnes making up 22 per cent of total seizures in 2020 compared to 10 per cent in 2019. The average seizure in 2020 weighed 5,108kg, compared to 2,133kg in 2019 and 1,329kg in 2018. The trend towards larger individual seizures could indicate more effective enforcement but also more systematic illegal trade of large quantities of HFCs. In the first half of 2021, just nine tonnes of HFCs were reported seized (in Romania), compared to 96 tonnes of HFCs in 29 seizures in the first half of 2020.<sup>14</sup>

Figure 18 illustrates seizure locations and quantities seized in 2019 and 2020. After multiple large seizures in 2018-19, Poland reported no seizures in 2020, potentially indicating that the illegal trade moved to more porous borders.

Romanian seizures in 2020 accounted for 38 per cent of the total seizures by weight. A higher proportion of high-GWP refrigerants were seized in 2020 compared to 2019. In 2020, more than one-third of the seizures were HFC-404A (up from 18 per cent in 2019) and 10 per cent were HFC-507A (up from four per cent in 2019). In contrast, HFC-134a, which constituted 33 per cent of the 2019 seizures, constituted only 19 per cent in 2020 (see Figure 19)\*.

Figure 17: HFC seizures in the EU, 2018-20



Above: Image of a Romanian HFC seizure.

\*Seizure data includes only publicly reported seizures and those reported to EIA by EU authorities. Where key information is missing from individual seizures EIA made certain assumptions to enable the analysis. Where the number of cylinders and the refrigerant is available EIA calculated the weight in kg based on usual size of refrigerant cylinders available on the market (e.g. HFC-404A at 10.9kg and HFC-134a at 13.6kg). Where the number of cylinders is provided but the refrigerant is unknown, the weight in kg has been calculated using an average cylinder size of 11.3kg. Where the volume of seizures is known and a list of refrigerants is provided but not their specific quantities, an assumption has been made that the refrigerants have been seized in equal quantities (the total weight of seizure is divided evenly between all refrigerants reported as seized).

Figure 18: HFC seizure locations in 2019 and 2020

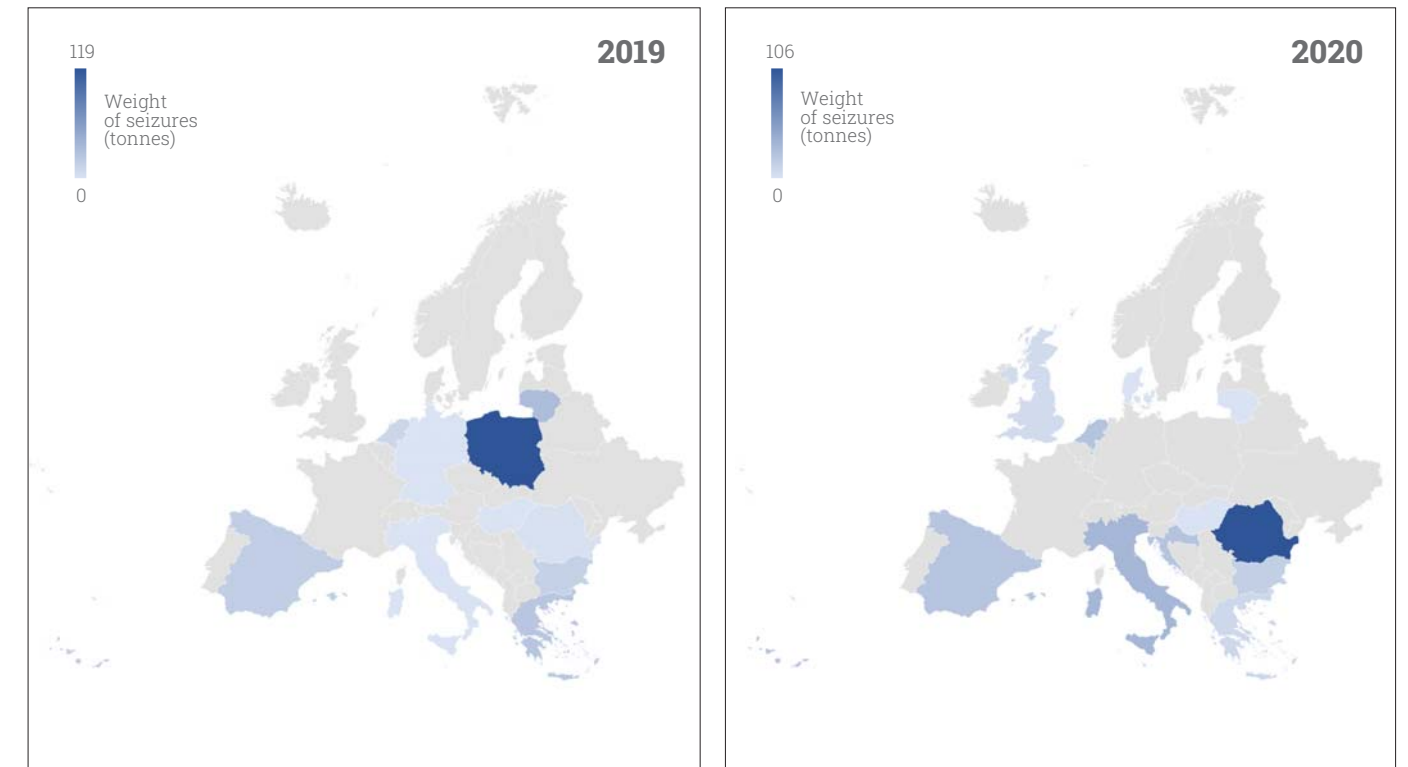
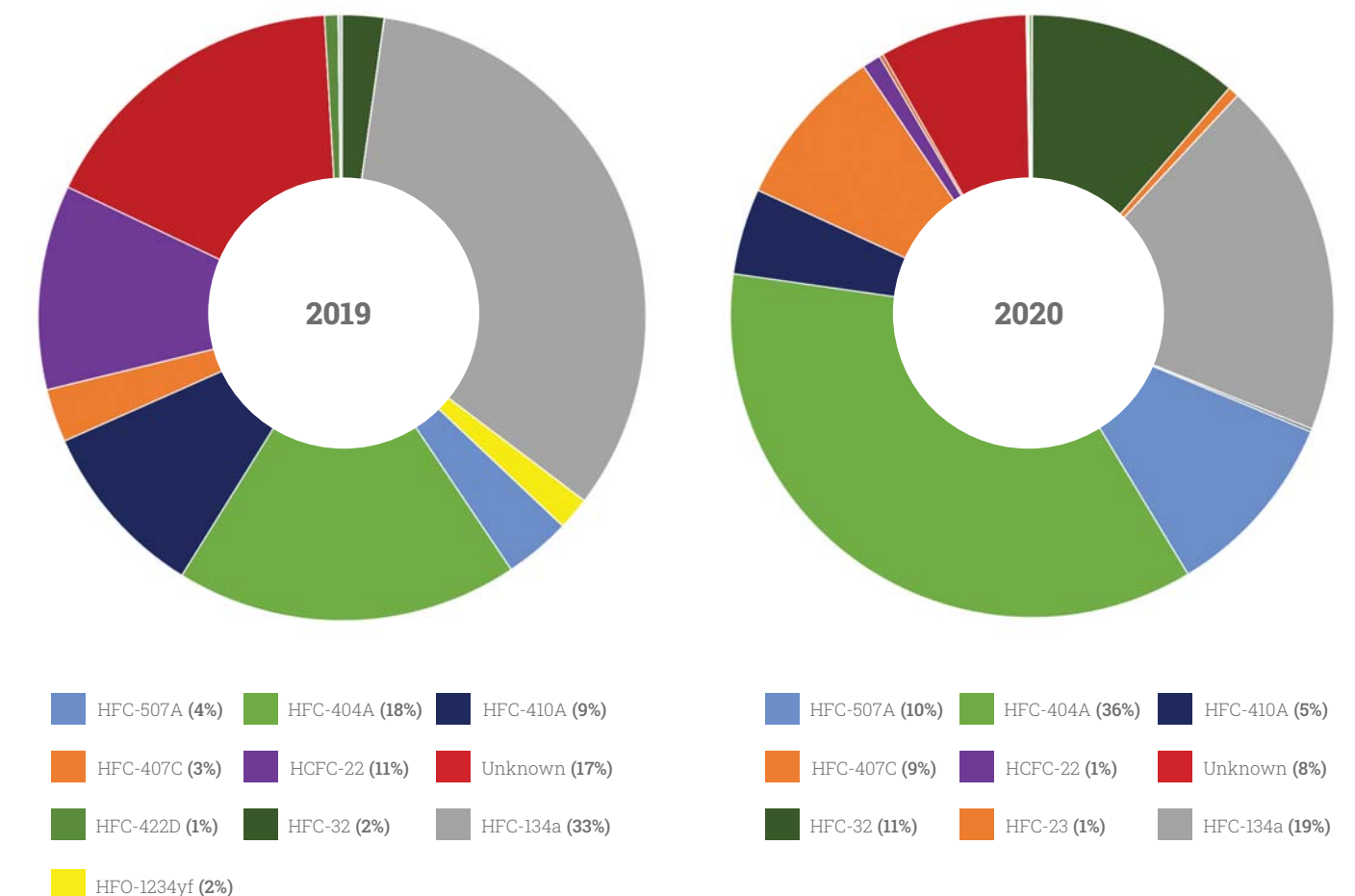


Figure 19: Proportion of different refrigerants seized by weight in 2019 and 2020.





investigations highlight the network of intermediaries involved in illegal trade and commonplace use of bribery to bring HFCs across the border into Romania. Although Romania is currently a key entry point for illegal HFCs onto EU markets, evidence from successful enforcement efforts in other illegal trade hot spots, such as Poland and Lithuania, suggests illegal traders are opportunistic and move to exploit markets with weak enforcement. Corruption at Romanian border points will need to be addressed.

Information from HFC seizures suggests abuse of T1 Transit procedure is a key method for non-quota HFCs to enter and travel across Europe. This is an issue member states are aware of and keen to address, with broad support for risk profiling and better monitoring of F-gases in transit. For example, Bulgaria suggested GPS tracking of consignments and communicating with customs from other member states; Luxembourg suggested sporadic verification of whether F-gases in transit arrive at their declared destination; and the Netherlands recommends monitoring via the Single Window. Estonia now monitors all F-gases in transit though the country. Poland highlighted various other measures to address the problem, such as: limiting trade to trusted operators or F-gas registered companies, prohibiting transit of disposable cylinders and amending the F-Gas Regulation to give a clear role to customs.

EIA investigations highlight the complex HFC supply chain, often involving several intermediaries before reaching the end-user. Under the current F-Gas Regulation, quota requirements apply only to companies “supplying or making available [HFCs] to another party in the Union for the first time.” EU members states have highlighted the enforcement challenges presented by the lack of legal responsibility

## Conclusions

HFC climate crime is a threat to EU climate targets. The evidence points to significant illegal trade in HFCs in many parts of Europe since 2018, driven by high profits and low risk of detection or serious consequences.

Analysis of trade data indicates that front door smuggling of HFCs into the EU continued in 2018 and 2019. HFC imports into the EU, according to European trade data, have been consistently higher than imports reported under the HFC Registry since 2017, with a difference of an estimated 9.1 MtCO<sub>2e</sub> in 2019.

The impact of an additional 9.1 MtCO<sub>2e</sub> imports would result in 2019 HFC supply being seven per cent over the allowable quota of 100.3 MtCO<sub>2e</sub>.

Chinese HFC trade data indicates a large influx of unreported HFC imports into the EU in 2018, with other years more closely aligned to European trade data reports. Turkey appears to have played a key role as a source country for illegal HFC imports in 2018 and 2019; exports from Turkey to the EU fell considerably in 2020, although pandemic-related impacts make it difficult to draw conclusions regarding the 2020 situation at this time.

Although the size of the illegal HFC trade cannot be accurately estimated, EIA believes it is significant, likely between 20-30 per cent of the legal trade. This is based on:

- the availability of suspected illegal HFCs in the countries examined by EIA. EIA investigators were offered 17.5 tonnes of suspected non-quota HFCs, equivalent to 7.5 per cent of Romania’s total reported HFC imports for 2020;
- European customs and HFC registry trade data discrepancies (which indicate an 11 per cent bulk import discrepancy on a CO<sub>2e</sub> basis in 2019);
- export and import trade data discrepancies (such as the more-than-four-fold difference between Turkey-

**Above:** Port of Rotterdam where 14 tonnes of HFCs in disposable cylinders were seized in July 2020.

reported exports to EU28 and EU reported imports in 2020 and the 13 per cent difference between China-reported exports to EU28 and EU-reported imports from China in 2020);

- the almost two-fold growth in Chinese exports to EU border countries between 2015-2019;
- the growth in number and size of HFC seizures, presenting concrete evidence of organised illegal HFC trade;
- estimates by industry and government stakeholders. For example, the European Fluorocarbons Technical Committee (EFCTC) reported that up to a maximum of 31 MtCO<sub>2e</sub> – 30 per cent of the allowable quota – could have entered the EU illegally in 2019, based on discrepancies between export/import trade data and increases in exports from China to EU neighbouring countries.<sup>15</sup> A representative of General Gas, an Italian refrigeration company, estimated 20 per cent of Italy’s market was lost to illegal HFC sales in the two years to mid-2020.<sup>16</sup> A 2020 survey of automotive repair garages in the German state of Hessen estimated that approximately 25 per cent of the total volume of HFC-134a used was illegal.<sup>17</sup>

EIA investigations identify Romania as a key entry point for illegal HFCs into EU markets, with Chinese-made HFCs entering from Turkey and Ukraine. The



**Above:** A survey of automobile garages in Hessen, Germany estimated that 25 per cent of HFC-134a used was illegal.

once HFCs have been placed on the market and how that applies to illegal e-commerce. In an effort to improve supply chain traceability, Germany has recently amended its Chemicals Act, obliging all HFC supply chain players to provide documentation associating HFCs with quota.

According to data from the EEA, the number of companies reporting bulk HFC imports almost doubled from 2018-19 (from 895 to 1,694),<sup>18</sup> many with no apparent links to the F-gas business.<sup>19</sup> The large number of new companies involved makes it harder to prevent illegal imports; with so many new entrants, the quota allocation amounts have dropped below the reporting verification threshold, thus reducing the possibility of detecting illegal activities or misreporting



**Above:** The demand for illegally imported HFC-404A is believed to come from the commercial refrigeration sector.

to the F-Gas registry.<sup>20</sup> Removing reporting and exemption thresholds, along with allocating HFC quotas at cost through an auction or allocation fee, can help address these challenges.

Information from investigations, seizures and industry point to increasing amounts of HFC-404A being traded illegally. This suggests compliance challenges associated with the service ban, which prohibits the use of HFCs with a GWP of 2,500 or more to service refrigeration equipment with a charge of more than 40 tonnes of CO<sub>2</sub>e from 2020. HFC-404A is predominantly used in commercial and transport refrigeration systems. According to the Montreal Protocol's Refrigeration and Technical Options Committee, the shift away from HFC-404A in transportation systems in Europe appears to be complete, with HFC-452A used both in new systems and as a drop-in replacement.<sup>21</sup> Evidence from EIA's investigations suggests ongoing demand for HFC-404A in the refrigeration sector is driving the black market.

Following enforcement efforts targeting the use of disposable cylinders, traders are now shifting to disposable refillable cylinders to avoid detection. This poses enforcement challenges, as the use of easily identifiable disposable cylinders previously facilitated seizures of HFCs, even after they had been placed on EU markets. Banning the use, possession and transport of disposable cylinders is an important measure to help reduce illegal trade and prevent emissions. Additional steps need to be taken to ensure refillable cylinders are accompanied by genuine and effective takeback schemes.

Illegal trade in HFCs increases GHG emissions, slows the uptake of climate-friendly alternatives and investment in clean technologies, reduces profits for legitimate businesses, reduces government income through avoidance of taxes, adds burden on enforcement agencies and undermines the rule of law.

Major enforcement efforts carried out in 2020 have made an impact, but EIA is concerned that the lack of seizures in the first half of 2021 reflects a lull in enforcement efforts on the part of member states and OLAF, which risks undermining progress made in 2020.

Given the reduction in available quota starting in 2021, there is an urgent need to strengthen the current monitoring and enforcement system and upscale enforcement capacity in Member States to put an end to the illegal trade in HFCs. As the rest of the world begins to phase down HFCs under the Kigali Amendment, the review of the F-Gas Regulation is a timely opportunity to create a 'gold standard' HFC monitoring, reporting and verification system. Demand reduction measures, such as further ambitious sectoral bans on the use of HFCs in new equipment, will also support efforts to combat illegal trade.

## Recommendations

### Recommendations for measures under the F-Gas Regulation

- Introduce EU-wide dissuasive minimum penalties for non-compliance
- Introduce a real-time HFC licensing system through the Single Window for Customs which includes HFCs in transit and a separate bulk import quota system
- Introduce additional controls on HFCs in transit, including mandatory registration in the HFC Registry for consignees of T1 and designation of a limited number of the customs points where transit procedures can be opened and closed
- Introduce an HFC quota allocation fee or auctioning system with revenue directed toward member state and EU market surveillance and enforcement
- Mandate certification of all importers of F-gases and ensure only those with sufficient real-time HFC quotas are allowed to place HFCs on the market
- Mandate certification and record-keeping for downstream sellers of HFCs, including online retailers
- Prohibit the transport, storage and use of HFCs in non-refillable cylinders
- Prohibit the sale and possession of HFCs illegally placed on the market, including online sales
- Remove thresholds for HFC quotas (less than 100 CO<sub>2</sub>e tonnes) and reporting (less than 10,000 tonnes CO<sub>2</sub>e)
- Ensure transparency of HFC quota allocation and provide full access to the HFC Registry to customs authorities and the public
- Support HFC demand reduction through further ambitious sectoral bans
- Phase out the use of HFC-404A (including reclaimed HFC-404A) and other very high-GWP HFCs
- Ensure that seized HFCs are destroyed

### Recommendations for EU member states and industry stakeholders

- Increase awareness of the impacts of HFC climate crime within customs and enforcement agencies, aimed at increasing inspections and market surveillance
- Support cooperation between customs, enforcement and F-gas authorities at national and international levels
- Implement regular risk profiling and risk assessment processes to detect illegal imports
- Undertake domestic measures to ensure full traceability of HFCs throughout the supply chain, enabling authorities and buyers to track the legality of HFCs, and include penalties for possession of HFCs with no legitimate quota
- Coordinate between member states to pursue prosecution of individuals illegally importing HFCs and moving HFCs across jurisdictions
- Purchasers of HFCs should avoid online sales and purchase HFCs from reputable suppliers
- Support the uptake of climate-friendly natural refrigerants

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