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The Environmental Investigation Agency (EIA) presents an analysis of Hydrofluorocarbon (HFC) trade data and information from industry and Member States relating to the illegal trade in HFCs.

EFCTC is pleased to welcome an update of the initial report by the Environmental Investigation Agency that was presented by Fionnuala Walravens (EIA campaigner) at the 18th European Conference on Latest Technologies in Refrigeration and Air-conditioning (Milan) held on 9 June 2019. “The new EIA work reinforces the magnitude of the illegal import of HFCs into the European Union,” noted Dr Nick Campbell, Chairman of EFCTC, “Member States and the European Commission are taking action to stop such imports that can have both safety and environmental effects. It is essential that such actions are stepped up to ensure that such imports are stopped as soon as possible and that appropriate penalties are in place to act as a deterrent to prevent further imports.” EFCTC has launched an Action Line to enable the confidential reporting of such potential illegal trade in HFCs. <https://efctc.integrityline.org/>

ABSTRACT

The Environmental Investigation Agency presents an analysis of Hydrofluorocarbon (HFC) trade data and information from industry and Member States relating to the illegal trade in HFCs. Illegal trade of HFCs undermines the European Union's (EU) F-gas Regulation, results in additional HFC emissions that fuel global warming and significantly reduces government income and the profits of legitimate businesses.

EIA analysis suggests that as much as 16.3 million tonnes of carbon dioxide equivalent (MtCO₂e) of bulk HFCs were illegally placed on the market in 2018, equivalent to the annual emissions of four coal fired power stations. This represents more than 16% of the 2018 quota and is in addition to illegal imports of HFC-containing equipment and illegal HFCs that are undoubtedly being smuggled under the radar of customs. These findings are supported by EIA's industry survey which shows widespread illegal trade in HFCs across the EU. This paper highlights the methods commonly used and proposed various tools member states, customs and the European Commission can use to tackle HFC smuggling.

Introduction

HFCs were introduced as replacement chemicals to Ozone-Depleting Substances (ODS), which are being phased out by the Montreal Protocol due to their impact on the ozone layer. Although HFCs do not deplete the ozone layer, they are potent greenhouse gases, with global warming potentials (GWP) of the commonly used HFCs ranging between 675 and 3,922.ⁱ In the past two decades, global emissions of HFCs have soared and, in 2015, baseline emissions were predicted to reach 4.0-5.3 billion tonnes of carbon-dioxide equivalence per year (GtCO₂/year) by 2050.ⁱⁱ

The need to address HFCs has long been recognised by the European Union (EU). In 2014, the EU significantly strengthened the old F-gas Regulation (which had been predominantly based on a model of containment), to include an economy-wide phase-down in HFC supply and a number of bans on HFC use in certain equipment and products.ⁱⁱⁱ The new F-gas Regulation aims to cut HFC use by 79% by 2030 from the 2009-2012 baseline. Starting in 2015, it stipulates a step-wise decrease in HFC supply, with major reductions from the baseline of 37% in 2018 and 45% in 2021. The placing on the market of HFCs is controlled through a quota system which allocates allowances to companies based on CO₂e.

As early as 2016, reports of illegal (non-quota) HFCs in European markets began to emerge. Major HFC producer Honeywell claimed that 10 million tonnes CO₂e of HFCs had been illegally imported in 2015, equivalent to more than 5% of the total quota allocation.^{iv} Such reports have since grown both in frequency and severity, with 2018 witnessing a deluge of reports of illegal HFC use and trade throughout the EU.^v EIA analysis suggests that the amount of non-quota HFCs being imported continues to grow.

Illegal trade of HFCs undermines the EU F-gas Regulation, results in additional HFC emissions that fuel global warming and significantly reduces government income and the profits of legitimate businesses. Governments are losing considerable tax revenues due to the illegal HFC trade. Through direct loss of VAT and import duties as well as through the indirect impact that illegal trade has on the profits of legitimate HFC importers. A recent report from Polish NGO PROZON estimated that Poland's treasury lost €7 million in 2018 due to illegal refrigerant imports valued at €55 million.^{vi} Losses to the Lithuanian and Greek exchequers have been estimated at €5 million^{vii} and €20 million^{viii} respectively.

Trade data analysis

The Environmental Investigation Agency (EIA) utilised European customs data to examine trade in bulk^{ix} HFCs from 2016-18. 2018 marked a significant step in the EU HFC phase-down with HFC supply being cut by 37% from the baseline. We would therefore expect to see a corresponding drop in HFC imports. Although customs data shows that EU total bulk HFC imports fell in 2018 compared to 2017 it increased compared to 2016. EIA's analysis of European customs data suggests that bulk HFC imports were some 16.3 MtCO_{2e} above the available quota of 101.2 MtCO_{2e}, more than 16% over the allowable quota. This could be characterised as open smuggling of HFCs (i.e. imports openly shipped through customs).

At a member state level, EIA identified a trend of significantly increased imports over 2016-2018 in a number of countries that could indicate illegal trade hotspots. For example, imports of HFCs in 2018 were more than 100% higher than 2016 imports in Austria, Belgium, Denmark, Greece, Ireland, Latvia, Malta, Poland, Portugal, Romania and Sweden. Although these could be explained by more accurate end-country reporting as the Netherlands, the EU's largest importer, reported a decline in imports during this period.

EIA then compared European customs data to company reported HFC Registry data presented by the European Environment Agency (EEA) between 2016-2017. For both years customs data showed consistently higher levels of HFCs being placed on the market than that reported to the HFC registry. In 2017, the discrepancy was 14.8 MtCO_{2e} (equivalent to 8.7% of the total quota for 2017). Reports to the HFC Registry are self-declared and there is currently limited or no cross-checking with customs data, giving clear potential for manipulation of HFC Registry reported data. A possible explanation for this discrepancy could be that companies with HFC quotas are under reporting HFC imports or over reporting HFC exports to the HFC Registry.

Finally, EIA compared Chinese reported HFC exports to the EU with EU reported HFC imports from China during 2016-17. Chinese reported HFC exports to the EU in 2016 were 10.2% higher than European reported HFC imports from China. This figure dropped to 3.2% in 2017. Consistently higher Chinese reported exports could be explained by a time lag between export and import or incorrect assignment of transit country as an end destination, but it could also be an indication of HFCs being mis-declared at the point of import into the EU.

HFC prices

The HFC phase-down works by cutting supply and raising prices of HFCs to the EU market to incentivise transitions to low-GWP alternatives. 2017 saw European HFC prices soar in anticipation of the 2018 HFC quota cut. By the second quarter of 2018, the price of HFC-410A was 859% higher for Original Equipment Manufacturers (OEMs).^x Similar price hikes have been seen for other HFCs. According to the latest price monitoring report by Öko-Recherche, prices in 2018 have flattened out to a large extent and demand for refrigerants, despite the large quota cut, was said to be low. Potential reasons for this include stockpiling in previous quarters (i.e. in 2017), increased care in handling refrigerants, reduced demand due to transitions to lower GWP technologies and possible illegal trade.^{xi}

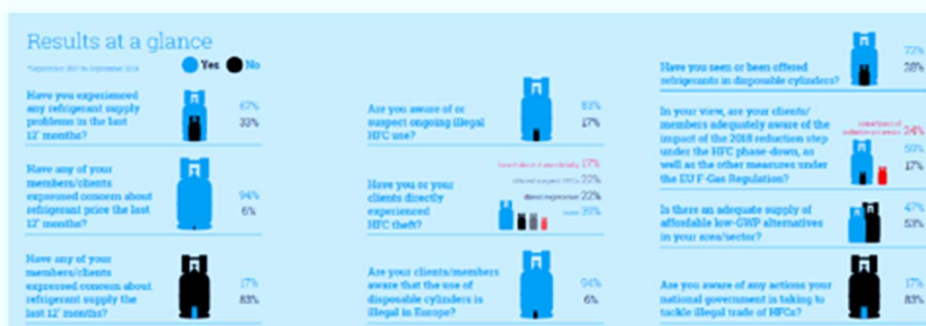
EIA Industry Survey

In September and October 2018, EIA sent a questionnaire to a range of European heating, ventilation, air-conditioning and refrigeration (HVACR) representatives, including industry associations, refrigerant suppliers and contractor associations. The survey requested information on refrigerant prices, the scale and severity of illegal HFC use, potential drivers of illegal trade, awareness of current penalty regimes in member states and recommendations for improving enforcement of the F-gas Regulation.

Responses were received from 18 companies, primarily refrigerant suppliers and industry associations, in 11 EU member states. Reports from industry indicate that large-scale illegal HFC trade and use is occurring in an absence of effective enforcement by member states. More than 80% of companies surveyed by EIA were aware of or suspected illegal HFC trade and 72% had seen or been offered refrigerants in illegal disposable cylinders.

EIA asked whether respondents were aware that disposable cylinders were illegal and if they had been offered HFCs in disposable cylinders or seen any in use. Disposable cylinders facilitate illegal trade because they are easy to transport and difficult to trace; they have been banned from being placed on the market in the EU since 2006. Only one respondent felt that its clients/members were unaware of the ban. Despite this, 72% of respondents had seen or been offered refrigerants in disposable cylinders. Respondents from Denmark and Greece noted that although their clients are aware of the ban, they may still buy disposable cylinders as they are cheaper and easily available. The automotive sector was highlighted as an area where they are used heavily. Trading platforms such as eBay and Facebook were mentioned as key selling tools for disposable cylinders.

Figure showing the findings at a glance. Detailed information can be found in EIA's report "Doors Wide Open: Europe's flourishing illegal trade in HFCs"^{xii}



Methods and scale of illegal trade in HFCs

Information from industry stakeholders alongside media reports and trade data analysis suggests a growing prevalence of illegal HFC trade across the EU. HFCs appear to be coming into Europe from China directly and via EU-border countries, in particular via Russia, Ukraine, Turkey and Albania. Poland has been repeatedly highlighted as a first point of import for illegal HFCs entering the EU. Although many other countries are swamped with illegal HFCs, with multiple industry sources reporting that illegal refrigerants constituted 50-80% of the Greek, Bulgarian and Romanian markets. The prevalence of illegal HFC-134a in the mobile air-conditioning (MAC) servicing market has also been repeatedly raised. In Italy, around 5-10% of the mobile air-conditioning HFC market is estimated to be illegal^{xiii} while in Poland illegal HFC imports have been estimated to amount to approximately 40% of the entire Polish market.^{xv}

There are various ways in which non-quota HFCs can enter the European market:

-*Open smuggling*. This is where companies import non-quota HFCs openly labelled as HFCs through the normal customs channels. The companies responsible could be registered in the HFC Registry or not.

- *HFCs can be concealed either physically or through fraudulent documentation*. For example, mislabelling the type, purpose or destination of the HFC shipment. The significant discrepancies between Chinese export and European import data could be an indication of fraudulent import declarations.

-*Offloading in transit*. For example, instances of refrigerants coming through Greece 'in transit' from non-EU countries to other non-EU countries, but then offloaded and replaced with empty cylinders to ship onwards have been reported.

-*Smuggling via land and sea borders*. There have been multiple accounts of illegal HFCs entering the EU via Russian and Ukraine EU land borders in vehicles. The recent seizure of 25 tonnes of illegal HFCs imported to Poland from Ukraine suggests that this may be a significant problem.^{xvi}

-*Shipments in large tanks*: To date EIA is not aware of any seizures of illegal HFCs shipped into the EU in large tanks or ISO tanks. However in EIA's experience, such large shipments are rarely checked by customs officials due to unfamiliarity with the process, lack of adapters needed to take a sample or lack of facilities to test the refrigerants.

-*Illegal internet sales*: Online platforms are a popular way of selling illegal HFCs. Some enforcement efforts have enabled suspicious adverts to be removed, however the actual seller is rarely prevented from posting a new advert the following day.

Why it pays to break the law

In March 2018, a two-day inspection of cars crossing the Polish-Ukraine border at Dolhobyczow highlighted the lucrative nature of black market trade in HFCs. Three attempts to smuggle HFCs hidden in LPG tanks were prevented by customs officers. The cars contained between 64-90 litres of refrigerant; two of the cases were confirmed to be smuggling HFC-134a, with a market value of PLN4,600 (€1,060)- PLN6,500 (€1,510). The culprits were fined between 15-21% of the market value.^{xvii}

According to PROZON, the culprits and the cars, with refrigerant still in them, were sent back to Ukraine, leaving them at liberty to make another attempt at smuggling the HFCs into Poland. This not only highlights the potential scale of illegal HFCs flooding into Poland from non-EU border countries but also shows the need for more effective enforcement through confiscation of illegal refrigerant and higher fines to deter repeat offenses.

Regulatory Loopholes

The current regulatory system is inadequate to allow customs officials to control HFC trade at the European border:

1. Quotas and authorisations are not needed for imports of less than 100 tCO₂e of HFC per year (in equipment or as bulk gas). This is almost 70kg of HFC-134a.
2. Although customs officials have access to the HFC Registry, where they can check whether or not an importer is registered and access the importer's annual quota allocation or authorisation, there is currently no access to real time information that can tell customs how much a company has already imported. Even if an importer was clearly importing an amount in excess of the company's annual quota (e.g. in one shipment), customs are still not able to determine that the shipment is in contravention of the F-gas Regulation since the importer could claim (legitimately or otherwise) that part of the shipment is for re-export outside the EU, and therefore outside of the quota system. This allows a company to legitimately exceed its annual quota as long as it exports any excess by the end of the reporting year.
3. Units declared on the Single Administrative Document (SAD) at customs are in kilogrammes or tonnes, whereas HFC quota is measured in tCO₂e. This puts the onus on customs officials to estimate tCO₂e, potentially a complicated task, particularly for equipment imports.
4. There is no obligation to cross check data reported to the HFC Registry with EU customs data. This is of particular concern given the huge influx of new entrants, i.e. new companies joining the Registry. A total of 1,699 companies reported during 2017, 33% more than the previous year.^{xvii}

Tools to Combat Illegal Trade

-HFC licensing: EU trade in ODS was controlled via a per shipment licensing system. Issued on a per shipment basis, HFC licences could be used to ensure a company stays within its quota. For example if a company wishes to export HFCs it would only receive that credit back on its quota once the export has occurred. HFC licensing would also enable customs to cross check importer declarations with exporter information.

The EU is currently looking at automatically linking customs declarations with the data in the HFC Registry through the Single Window environment for Customs, which could allow real-time access to remaining quota. However efforts to mandate CO₂e as a mandatory measure on the TARIC code, to enable comparison between customs and HFC Registry data, have so far failed. Moreover the system is not operational in all EU Member States and will take several years to set up.

-Banning Non-Refillable Containers: Although the placing of non-refillable ('disposable') containers of HFCs on the market has been banned in the EU since 2006, those placed on the market before 2006 as well as cylinders sold where provisions are made for their return and refilling are exempt. These exemptions make it difficult to enforce the ban. A comprehensive ban on the use of disposable cylinders should replace the current 'placing on the market' ban.

There are also indications that high refrigerant prices are driving a trade in 'disposable refillable' cylinders, whereby refillable cylinders are being illegally placed on the market, without provisions for return and refill.^{xviii} Member States need to give clear guidance on a comprehensive system to ensure cylinders are returned and refilled.

Conclusion

Given the availability of cheap HFCs outside the EU, it is not surprising that much of the illegal trade is reported to be occurring at EU border countries. The current HFC reporting system does not allow customs authorities to determine whether or not HFC shipments are within quota and a number of loopholes in the system allow unscrupulous traders to reap quick profits, exploiting a demand for cheap HFCs with little risk of punitive measures.

Enforcement of the F-gas Regulation is clearly hampered by the absence of a system whereby customs officials can determine if an import of bulk HFCs or HFCs in equipment is covered by quota and have the power to prevent a shipment which takes an importer over its quota. This is an essential requirement of a licencing system, which is now required under the Montreal Protocol's Kigali Amendment, and should be implemented without delay.

This is particularly critical in light of the significant rise in the number of companies registered to trade. Thousands of companies are now, to some extent, legitimised at customs level through their company name being registered in the HFC Registry, however customs has no way of assessing whether they are importing within their quota or reporting actual imports to the HFC Registry. Allocating quota at cost would also help deter illegitimate traders from joining as new entrants in the future.

The widespread use of disposable cylinders in the illegal trade warrants efforts by member states to make legislative changes to ease the enforcement challenge. The current ban under the F-gas Regulation should be strengthened to ban the use (not just the placing on the market) of all non-refillable cylinders. The EU and industry should also push for a global ban on disposable cylinders.

Finally, there is an urgent need to immediately improve enforcement. Member states need to coordinate decisive action on HFCs and tighten border control. Member states need to seize, prosecute and apply sufficiently high penalties. Penalties that have been determined by member states are generally not high enough to deter HFC smuggling and are rarely applied.

Recommendations for Industry to support and raise with Member states and the European Commission

- **Implement a fully functional per shipment HFC licensing system**, which allows customs officials to obtain necessary real-time information to determine if HFC imports are within the specified quota for a particular company.
- **Make the HFC Registry more transparent** in order to improve accountability. Names of new entrants and data on quotas allocated to individual companies should be publicly available.
- **Allocate HFC quotas at cost** to reduce the pressure on customs from the rapid rise in new incumbents and to help fund the HFC licensing system.
- **Revise the ban on non-refillable cylinders** to prohibit the use of all disposable cylinders.
- **Set up a system to systematically compare HFC registry data with customs data** and investigate discrepancies.
- **Increase penalties** for Regulation infractions and ensure they are regularly applied and communicated through industry and media channels.

Actions industry can take right now

- **Improve capacity-building**, engage with training and support for customs
- **Provide greater resources to investigate illegal HFC trade**, carry out regular market surveillance and inspections including online marketplaces, share these findings within industry and the wider enforcement community
- **Carry out regular targeted awareness raising** amongst customers
- **Promote low-GWP energy efficient technologies** through incentives and support additional bans on HFC-containing equipment.
- **Invest in the installation and servicing sector**, ensuring contractors are trained and equipped to work with flammable refrigerants and to ensure the efficient recycling and reclamation of HFCs.
- **Reduce further demand for illegal HFCs by increasing incentives and reducing barriers for HFC reclamation.**

ⁱ E.g. GWP of HFC-32 is 675, GWP of HFC-410A is 2,088, HFC-404A is 3,922

ⁱⁱ Velders et al (2015). Future atmospheric abundances and climate forcings from scenarios of global and regional hydrofluorocarbon (HFC) emissions. Atmospheric Environment Volume 123, Part A, Pages 200-209. Available at <https://www.sciencedirect.com/science/article/pii/S135223101530488X>

ⁱⁱⁱ Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014R0517>

^{iv} Cooling Post (2016). 10m tonnes of illegal F-gas enters Europe. Available at: <https://www.coolingpost.com/world-news/over-10m-tonnes-of-illegal-F-gas-enters-europe/>

^v As reported in Cooling Post, ACR Journal and racplus.

^{vi} Cooling Post (2019). Illegal imports cost Polish treasury €7m in 2018. Available at: <https://www.coolingpost.com/world-news/illegal-imports-cost-polish-treasury-e7m-in-2018/>

^{vii} Cooling Post (2018). Baltic states hit by illegal imports. Available at: <https://www.coolingpost.com/world-news/baltic-states-hit-by-illegal-imports/>

^{viii} ACR Journal (2018). Greece calls for action on illegal refrigerants. Available at: <http://www.acrjournal.uk/international/greece-calls-for-action-on-illegal-refrigerants>

^{ix} Bulk refers to HFCs not placed inside equipment.

^x Oko-Recherche (2019). Monitoring of refrigerant prices against the background of Regulation (EU) No 517/2014. Q3/2018 – January 2019.

^{xi} *Ibid.*

^{xii} Environmental Investigation Agency (2019). Doors Wide Open: Europe's flourishing illegal trade in hydrofluorocarbons (HFCs). Available at <https://reports.eia-international.org/doorswideopen>

^{xiii} Pers. Comm. (2018). Italian refrigerant supplier.

^{xiv} Cooling Post (2019). Illegal imports cost Polish treasury €7m in 2018. Available at: <https://www.coolingpost.com/world-news/illegal-imports-cost-polish-treasury-e7m-in-2018/>

^{xv} Cooling Post (2019). Poland stops huge shipment of illegal refrigerant <https://www.coolingpost.com/world-news/poland-stops-huge-shipment-of-illegal-refrigerant/>

^{xvi} Cooling Post (2018). Poland swamped by illegal refrigerant. Available at: <https://www.coolingpost.com/world-news/poland-swamped-by-illegal-refrigerant/>

^{xvii} European Environment Agency (2018). Fluorinated Greenhouse Gases 2018. EEA Report No 21/2018. P12. Available at: <https://www.eea.europa.eu/publications/fluorinated-greenhouse-gases-2018>

^{xviii} Cooling Post (2019). Rise of the disposable "refillable". Available at <https://www.coolingpost.com/world-news/rise-of-the-disposable-refillable/>

The European FluoroCarbons Technical Committee is a Cefic Sector Group that monitors legislation related to HFCs (hydrofluorocarbons), and HFOs (hydrofluoro-olefins) in the EU and at global level. Fluorocarbons are used as feedstock, as refrigerants, as solvents and as blowing agents for insulation plastic foams.

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