

Background paper on the study by Fraunhofer

# **The irregular e-cigarette market in Europe — a symptom of global supply chain problems**

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The background paper explains the key findings of the Fraunhofer study and places them in the broader context of global supply chains—supplemented by quotes and assessments from the study's authors, who shed light on the challenges and possible solutions from their respective perspectives.

## 01 Why the topic is relevant

The market for vaping products encompasses a wide range of systems, flavors, and product concepts. The offering ranges from inexpensive disposable e-cigarettes and uncomplicated pod systems to modular devices with refillable tank vaporizers and individually adjustable power settings.

In Europe, the market for these products is experiencing dynamic growth—driven by technological progress, new consumer habits, and online retail. But this boom has a downside: a significant proportion of the products are not subject to government control.

According to analyses conducted by the **Fraunhofer Institute for Integrated Circuits IIS** in collaboration with **MRU GmbH** and commissioned by **SKR AG**, around **48 percent of vapes**—i.e. electronic vaporizers such as e-cigarettes—sold in Europe come from irregular sources.

The phenomenon affects far more than just the tobacco industry. It touches on tax policy, consumer protection, logistics and international trade relations as well.

The study provides the first **reliable, data-based foundation** for understanding the extent and mechanisms of this shadow market. Until now, the scope of the irregular market has only been roughly and indirectly assessed due to inconclusive usage samples, inaccuracies in foreign trade statistics and non-transparent trade flows.

## 02 Methodology & data basis

To quantify the irregular e-cigarette market, Fraunhofer IIS combined economic and logistics-related analyses with empirical data..

### The following were included:

- Foreign trade and customs statistics for the EU and individual member states
- Market segment data on production, import volumes and sales prices
- Supply chain analyses, including logistics routes and distribution structures
- Qualitative research on manufacturers, intermediaries, and online platforms

This interdisciplinary approach made it possible to distinguish between a **white, grey, and black market** for the first time. Grey and black products are considered irregular if they violate national tax regulations, labelling requirements or approval regulations—or if their origin cannot be clearly traced.

Previous estimates were based on small usage samples and roughly aggregated foreign trade data. There was a lack of uniform product classifications and links between consumption, customs and supply chain data. The study closes this gap, takes a holistic view of trade flows, supply chains, and market structures, and provides reliable figures for the first time.

## 03 Results in brief

- **48 percent** of the European e-cigarette market comes from irregular sources.
- The market volume of this segment amounts to **6.6 billion euros**.
- Around **35 percent** of the total market is accounted for by clearly illegal products.
- Around **90 percent** of e-cigarette imports into the EU originate from China, particularly from the Shenzhen region.
- **Germany, the Netherlands, and Belgium** are central hubs for further distribution within Europe.
- In Germany alone, there was a **tax shortfall of around 119 million euros** in 2024—and the trend is rising.

By 2030, the entire European market could grow to **10.8 billion euros**.

## 04 Regulation meets reality

In recent years, EU Member States have attempted to regulate the e-cigarette market with taxes, licensing procedures, and advertising restrictions. Such levies are intended not only to generate fiscal revenue, but also to have a steering effect on health policy and curb consumption, particularly among young people.

However, the study shows that as long as these measures vary from country to country, they fall short in the European single market.

Almost half of all e-cigarettes in the EU come from irregular sources—with consequences for tax revenues, consumer protection, and competition. Behind these figures lies a **structural failure between politics, the market, and logistics**: global flows of goods collide with national regulations, while control mechanisms are lacking.

**Uwe Veres-Homm**, Head of Risk and Location Analysis, Fraunhofer IIS:

*"National regulation reaches its limits when it comes to global supply chains. European harmonization and better control make sense—a ban, on the other hand, would be counterproductive. Our study shows that almost 50 percent of the market already operates outside regular structures, and the irregular sector tends to grow faster than the legal one. A complete ban would only reinforce this development."*

**Horst Manner-Romberg**, Managing Director, MRU GmbH:

*"The idea of regulating a globally available mass product nationally does not work. It is a fact that loopholes exist—and this has led to the emergence of markets that are not subject to the rules."*

**Rico Back**, Managing Partner, SKR AG:

*"The market for e-cigarettes demonstrates what happens when global supply chains encounter national regulations. As long as each country has its own regulations, gaps in the system will arise—and irregular trade will flow through these gaps."*

## 05 Market mechanisms & supply chains—how a market became unbalanced

Since the mid-2010s, the e-cigarette industry has evolved from a niche craft industry to industrialized mass production. Today, over ten billion disposable devices are manufactured annually—most of them on highly automated production lines in **Shenzhen**. E-cigarettes are thus a prime example of an industry that has become fully industrialized in China within just a few years.

Within Europe, **Germany, Belgium, and the Netherlands** in particular serve as logistical gateways. The market now has a high online share. Consumers are increasingly ordering directly from Asia, retailers are circumventing national taxes, and platform providers are benefiting from the lack of uniformity in EU regulations. The result is a steadily growing grey area between regulated and illegal trade.

**Uwe Veres-Homm**, Head of Risk and Location Analysis, Fraunhofer IIS:

*"In less than ten years, the e-cigarette industry has gone from manufacturing to mass production. Shenzhen is now the global epicenter—this is where the majority of devices are developed, manufactured, and packaged before entering the market via European air and sea freight hubs."*

**Rico Back**, Managing Partner, SKR AG:

*"While gateway countries such as Belgium, the Netherlands and Germany are heavily influenced by direct imports from China, countries such as Portugal and Finland handle the majority of their imports via intra-EU trade. The regulations, which vary from country to country, provide gateways and loopholes for irregular trade."*

### Quantity issues

The European market is being flooded with imports from China. The Belgian Central Economic Council (Conseil central de l'économie) has warned the country's government about 'an uncontrollable influx of parcels from China.

According to the Council, up to **4 million parcels** are currently being declared to Belgian customs every day. Of course, it can be assumed that not all of these parcels contain (illegal) vaping products.

However, the sheer scale of the volume makes it clear that **it is impossible to physically check every shipment** and that only random checks can be carried out.

## 06 Country comparisons & price differences

A key finding of the study is that e-cigarette consumption and market size in the EU are concentrated in **six particularly significant markets: France, Poland, Italy, Germany, the Netherlands, and Spain**. These countries represent the largest single markets in terms of expected total demand.

There are significant differences in **prevalence**: in 2023, the proportion of active vapers ranged from 0.5 percent in Portugal to 8.8 percent in Estonia; France was in the upper range at 7.4 percent, while Germany and the Netherlands were in the lower mid-range at 2.2 percent each.

**Price levels** vary considerably across the EU, mainly due to differences in excise duties and regulatory levels. Some countries do not (yet) levy a specific tax on nicotine-containing liquids (including France, Italy, and the Netherlands), while others impose very high taxes (e.g. Lithuania €0.63/ml, Slovenia €0.70/ml). This heterogeneity encourages price differentials and creates incentives for re-imports and circumvention transactions.

A comparison of the top six countries also reveals a wide divergence in **irregular market share**: France and Poland account for around 58 percent, while the Netherlands accounts for around 32 percent. In Poland, the irregular sector is predominantly organized commercially (black market), while in the Netherlands there is a high grey market share (around 37 percent) with a strong affinity for e-commerce.

**Uwe Veres-Homm**, Head of Risk and Location Analysis, Fraunhofer IIS:  
"Our data reveals significant regional differences in consumer behavior."

**Horst Manner-Romberg**, Managing Director, MRU GmbH:  
"When national taxes and regulations diverge, a bypass market automatically emerges. Such price differences create incentives for re-imports and smuggling. They also distort competition to the detriment of legal suppliers."

**Rico Back**, Managing Partner, SKR AG:  
"Logistics forms the backbone of the European single market—but when it comes to e-cigarettes, it is subject to different rules. This leads to goods flows merging and legal and irregular products often taking the same route through the supply chains."

## 07 Why the problem is so difficult to grasp

The irregular e-cigarette market operates through the same channels as the legal trade—just without the same obligations. An e-cigarette that is legally sold in Poland may be illegal in Germany. An online order from China is often indistinguishable from a legal import for customs authorities. In addition, parcels ordered online containing illegal e-cigarettes often simply get lost in the sheer volume of goods shipments arriving every day.

The problem is structural, not moral. It arises where regulations, technology and enforcement diverge.

**Uwe Veres-Homm**, Head of Risk and Location Analysis, Fraunhofer IIS:

*"The irregular market is not a classic smuggling market, but rather a side effect of globalized supply chains. The boundaries between legal and illegal do not run along containers, but along regulations—and these are not uniform across Europe."*

**Horst Manner-Romberg**, Managing Director, MRU GmbH:

*"Many of these products are not counterfeit or smuggled, but simply mislabeled, do not comply with the permitted content quantities and substances in Germany, are taxed incorrectly or not at all, or are legal in one country and illegal in the next. This makes the market so difficult to grasp—and the distinction almost impossible for authorities to make."*

**Rico Back**, Managing Partner, SKR AG:

*"In parcel logistics, millions of shipments are on the move every day, all looking the same on the outside, whether they are legal or not. No customs system in the world can sort them out manually. We need digital traceability, otherwise the shadow market will stay hidden in the regular flow of goods."*

## 08 Economic and social consequences

Der Schaden betrifft Wirtschaft, Staat und Verbraucher gleichermaßen:

- **Fiscal:** Member states lose hundreds of millions of euros in tax revenue every year.
- **Economic:** Legal suppliers are disadvantaged because they incur higher costs due to taxes, testing procedures and compliance.
- **Social:** The illegal market undermines consumer protection and weakens confidence in regulated products.

**Horst Manner-Romberg**, Managing Director, MRU GmbH:

*"E-cigarettes from irregular sources circumvent all consumer protection measures and evade quality control. This not only jeopardizes competition, but also potentially endangers the health of consumers."*

**Rico Back**, Managing Partner, SKR AG:

*"It is simply impossible for customs to check such quantities. We need intelligent systems that make supply chains traceable. Transparent, networked logistics is the most effective protection against illegal goods flows."*

## 09 How the market could be stabilized

The study identifies three structural starting points that could be effective regardless of political majorities:

- **Uniform definitions and product classifications**  
Many distortions arise because identical products are recorded, classified, and taxed differently in EU Member States. Uniform standards and a common data basis are prerequisites for effective regulation and tax collection.
- **Digital traceability and central data platform**  
Technologies for supply chain transparency, such as blockchain-based serialization or AI-supported risk assessment, can help distinguish legal goods flows from illegal ones. It is crucial that this data is collated in a central international platform. This would make it possible for the first time to link production, import and consumption data globally, thus enabling holistic market monitoring.
- **Cooperation with countries of origin**  
Particularly in the case of mass-produced goods from China, the most effective control is before export—not just at import. Close cooperation between European and Asian authorities, coupled with connection to the central data platform, could create transparency along the entire supply chain and curb illegal flows at source.

**Horst Manner-Romberg**, Managing Director, MRU GmbH:

*"As long as national rules diverge, there will always be loopholes. But with coordinated standards, the market can be stabilized significantly. A sensible approach would be to create a 'blacklist' or compliance database for importers and traders, which would be maintained in addition to the existing register."*

**Rico Back**, Managing Partner, SKR AG:

*"The key lies in transparency: through digital traceability along the entire supply chain and through cooperation with the countries of origin. Only when data flows can illegal goods flows be effectively curbed."*

## 10 The global context

The example of e-cigarettes is representative of a development that affects many globalized markets, from dietary supplements to electronics. The boundaries between legal, grey, and illegal become blurred when regulatory fragmentation and digital trading models collide.

The Fraunhofer study is therefore more than just a market analysis: it is a wake-up call for politicians, businesses, and logistics providers to ensure the functioning of the internal market.

Europe needs transparency, not only in data, but along the entire supply chain.

**Uwe Veres-Homm**, Head of Risk and Location Analysis, Fraunhofer IIS:

*"What we are seeing here is not an isolated case, but a structural signal. Global markets require cross-border control mechanisms—otherwise the internal market itself becomes a risk."*

**Rico Back**, Managing Partner, SKR AG:

*"Transparent supply chains are the new currency of global markets. Those who know where their goods come from not only protect their customers, but also the credibility of entire industries."*

### About the study

The study was conducted by the Fraunhofer Institute for Integrated Circuits IIS, Risk and Location Analysis Department, in cooperation with MRU GmbH. It was commissioned by SKR AG, a management consultancy specializing in logistics. The aim was to record the scope, structure, and economic impact of the irregular e-cigarette market in Europe for the first time on the basis of data and to identify options for action.

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