Factsheet E-Cigarettes
Waedenswil, June 2024

1 General

- Initially developed in China, electronic cigarettes first entered the Western market in 2008. But disposable versions are a much more recent phenomenon. First developed by Juul\(^1\) followed by many other brands, **disposable e-cigarettes first came onto the Swiss market in 2020\(^2\)**.

- An estimated 95% of the world's production of disposable e-cigarettes is of **Chinese origin**, with a concentration in the city of Shenzen\(^3\).

2 Amounts

- According to various sources, UNITAR (the United Nations Institute of Training and Research) estimates **844 million e-cigarettes were discarded worldwide in 2022\(^4\)**.

- Available information consistently shows a rapidly increasing consumption of e-cigarettes:
  - **Australia**: e-cigarette sales increased from $28.3 million in 2015 to $98.1 million in 2020\(^5\).
  - **Belgium**: According to an enquiry of the University of Antwerp, an increasing number of adolescents, but also primary school kids consume e-cigarettes\(^6\).
  - **UK**: data from 2022 estimates that about 168 million disposable e-cigarettes are being bought annually in the country\(^7\). Estimating for that same year that 2 disposable e-cigarettes are being thrown away every second in the UK\(^8\), this makes more than 63 million e-cigarettes being thrown away. **These numbers are rapidly increasing**. Compared to the previous year, the sales of e-cigarettes in 2023 doubled to 7.7 million a week (=almost 439 million/year). And the number of disposable e-cigarettes thrown away has soared to about 8 per second, i.e. nearly 5 million per week (= 252 million/year)\(^9\).
  - In the **USA**, from February 2020 March 26, 2023, monthly sales of disposable e-cigarettes increased by 196.2%, from 4.0 million units to 11.9 million units\(^10\); that is about 143 million annually. Their share of total e-cigarette sales (reusable + disposable) increased from 25.8% to 53.4\%\(^11\).

- According to SENS Recycling, in **Switzerland**, in 2022, around 10 million vapes were imported into the country\(^12\). Yet, according to the Federal Office for the Environment (FOEN) there does not currently exist detailed information and numbers on the importation and consumption of e-cigarettes in Switzerland (of different types; both rechargeable and disposable, because they do not receive specific data on this from e-cigarette sector\(^13\)).

3 E-cigarettes and the environment

3.1 Presence in the environment

- Considering their recentness, **e-cigarettes remain largely under the radar in discussions on littering**. And, for instance in Switzerland, there does not yet seem to exist coherent data on e-cigarette litter (cf. section 4.2 below).
Over the past years, in many countries, their increasing popularity has resulted in a rise in their litter prevalence\textsuperscript{14}, also in Switzerland\textsuperscript{15}.

In Switzerland, the Association pour la Sauvegarde du Léman (ASL) has observed during its clean-up Net’léman in 2022 that electronic cigarettes indeed are a new form of waste in the environment\textsuperscript{16}. This is corroborated by the Net’Leman from Mai 2024 which also observed an increased presence of disposable e-cigarettes among the collected litter\textsuperscript{17}.

While data are still limited on the number of e-cigarettes – disposable or not – that end up in the environment, available information from the US talks about 10% reportedly being littered\textsuperscript{18}.

### 3.2 Environmental impact

Although there are still limited scientific studies on the environmental impact of the e-cigarette life cycle, a meta-analysis of available research concludes that they may represent a significant long-term environmental threat due to the toxic nature of their composition\textsuperscript{19}. Also other research warns that e-cigarettes present a rising environmental threat\textsuperscript{20}.

According to some sources, e-cigarettes potentially present an even more serious environmental threat than classical cigarette filters\textsuperscript{21}.

### 4 Further problems

#### 4.1 Waste

**4.1.1 E-cigarette waste: general**

E-cigarettes do present a complex form of e-waste\textsuperscript{22}, comprising 3 forms of waste: (1) plastic waste (cigarette’s hull), (2) electronic waste (circuit boards & lithium-ion batteries) and (3) hazardous chemical waste (nicotine and other substance in the e-liquid). Therefore, for instance in the USA they are indeed classified as hazardous waste\textsuperscript{23}.

When thrown away in the normal household waste, e-cigarettes can cause fire. When lithium-ion batteries are included in household or recyclable waste, they are at risk of being struck or crushed, which can damage the separator between the cathode and electrode, causing a short circuit and a fire or explosion\textsuperscript{24}.

**4.1.2 E-cigarette waste in Switzerland**

Just as for the importation and consumption of e-cigarettes (all types; reusable and disposable) (cf. section 2 above), the Swiss authorities do not have information and data on how much waste this creates, but they estimate 20-30 tonnes of disposable e-cigarettes per year\textsuperscript{25}.

Also Switzerland is affected by the fire hazard of e-cigarettes in household waste. In just two months in the summer of 2023, 10 waste-sorting centres suffered fires caused by lithium-ion batteries, including those in Geneva, Gland, and Cressier\textsuperscript{26}.
• According to fragmented studies in Switzerland, reinforced by data from other countries, at least half of the disposable e-cigarettes end up in the trash\textsuperscript{27}; but the FOEN does not have information and data on this\textsuperscript{28}.

4.2 Recycling

4.2.1 E-cigarette recycling: general

• Notwithstanding many nice (...) words and initiatives by the responsible industry\textsuperscript{29}, the composition of e-cigarettes composed of very different components difficult to separate makes them very complex to recycle\textsuperscript{30}. In practice, e-cigarettes are little recycled\textsuperscript{31}.

4.2.2 E-cigarette recycling in Switzerland

• So far, e-cigarettes are not recycled in Switzerland. Even those collected for that purpose are currently just stored, waiting for the development of an industrial recycling process to take care of them. Such a process, however, does not yet exist\textsuperscript{32}; as confirmed by the FOEN\textsuperscript{33}.

• In Switzerland, public authorities (the FOEN) do not have data on recycling of e-cigarettes (what, how, where...) because these are covered by private industry and trade secrecy\textsuperscript{34}.

• In Switzerland, there is no standardized programme for recycling of e-cigarettes\textsuperscript{35}. The SENS eRecycling foundation\textsuperscript{36}, which counts Philip Morris International among its partners, introduced a recycling system for single-use e-cigarettes in July 2023 (also covering reusable e-cigarettes and heated tobacco products). But the process does not currently allow the entire device to be recycled. Only the battery and electronic components are recovered but the plastic is burned. The system also remains voluntary. Thus, according to SENS, about 5% of single-use e-cigarettes are currently being recycled\textsuperscript{37}.

4.3 Resource spoilage

• A survey in the UK in 2022 revealed that the lithium contained in e-cigarette batteries thrown away over the course of a year in the country would be enough to equip 1,200 electric vehicles\textsuperscript{38}. In line with the growing number of e-cigarettes bought and thrown away in the country (see section 2 above), in 2023 this already adds up to 5’000 electric vehicle batteries worth of lithium being thrown away annually\textsuperscript{39}.

• Considering that one e-cigarette contains about 0.15 g of lithium\textsuperscript{40}, and that an average car battery contains about 8 kg of lithium\textsuperscript{41}, the 844 million e-cigarettes discarded worldwide annually (reference year 2022; see section 2 above) would contain enough lithium to manufacture batteries for more than 16’500 car batteries.

4.4 Health impacts

• While often still promoted as healthier alternatives to classical cigarettes, in reality, e-cigarettes have many well-known negative health impacts\textsuperscript{42} and even in the absence of nicotine their health dangers should not be underestimated\textsuperscript{43}. 
5 Policy on e-cigarettes

5.1 International

- The sale of e-cigarettes is prohibited in 34 countries, including Mexico, Brazil, Norway, India, Turkey, and Thailand.

- In 87 other states, e-cigarette sales are subject to restrictions, such as a ban on selling them online or on offering certain flavours.

- In Australia, since October 2021, the purchase of nicotine containing e-cigarette products is only possible at a pharmacy with a prescription as part of a process to stop smoking. The Therapeutic Goods Administration (TGA) are developing new reforms that will mean all e-cigarette products will require a prescription and must be sold in pharmacy settings, even if they don’t have nicotine in them.

- Also China – while continuing to export them abroad - is taking actions to regulate (disposable) e-cigarettes within its territory.

- In the UK, the sale and supply of disposable e-cigarettes is being banned in England, Scotland and Wales. Northern Ireland will also consider introducing this in future.

- In the EU, Belgium, will prohibit disposable e-cigarettes as of 1 January 2025. The country has green light from the European Commission to do so. Also in France there are plans to do so.

5.2 Switzerland

- The motions Clivaz and Klopfenstein Broggini call for a ban on disposable e-cigarettes. Also the Interpellation by Laurence Fehlmann Rieles asks the Federal Council if it doesn’t ‘consider it necessary to ban the marketing of these products for environmental protection reasons?’ In all cases, the Federal Council expresses its opposition to a ban for various – notably economic (freedom of trade…) reasons and proposed to reject the interventions; maintaining that, “the question of whether a ban [of e-cigarettes] could be justified would require in-depth examination, during which the usefulness (...) and environmental harmfulness of single-use electronic cigarettes would have to be weighed up” (translated from French - tfF), and “a ban would be disproportionate in view of the interference with freedom of trade and industry that it would represent” (tfF).

- Different cantons have banned the sale of e-cigarettes to minors. At the national level, the Federal Law on Tobacco Products and Electronic Cigarettes (LPTab, FF 20212327), which is due to come into force in autumn 2024, would prohibits the sale of these products to minors in the whole country.

- The Federal Council (through the FOEN) expresses an explicit preference to leave the whole issue of (disposable) e-cigarettes to be dealt with through voluntary initiatives by the industry itself and leaves it to the industry to come with solutions (with explicit reference to art. 41a EPA).

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environmental impact of disposable vapes

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6 De Redactie (24.05.2024), Steeds meer jongeren vapen, ook in lagere school: "Het wordt ervaren als onschuldig, bijna gezond tussendoortje”
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26 Swiss Info (19.01.2024), op cit., 30’03”’. (interview with Michel Monteil, FOEN)
27 RTS (23.07.2023), Dans les centres de tri, les incendies liés aux batteries se multiplient. (referenced in SAfTC)
28 Swiss Info (19.01.2024), op cit., 06’30”’.
29 Ibid., 29’35”’. (interview with Michel Monteil, FOEN)
32 See i.a. Euronews Green (01.08.2023), Planet of the vapes: How big a problem are e-cigarettes, and where can they be recycled?
33 Ibid., 22’00”.
34 Ibid., 39’24”.
35 Ibid., 26’35”.
36 Swiss Info (19.01.2024), op cit., 18’30”’.
37 https://www.erecycling.ch/
38 Swiss Association for Tobacco Control, op cit.
39 The Bureau of Investigative journalism (15.07.2022), op cit. (referenced in SAfTC)
40 Material Focus (08.09.2023), op cit.
41 The Bureau of Investigative journalism (15.07.2022), op cit., also: House of Commons Library (28.11.2022), The environmental impact of disposable vapes, p. 4.
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