

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 Juul¹ followed by many other brands, **disposable e-cigarettes first came onto the Swiss market in 2020²**.
- An estimated 95% of the world's production of disposable e-cigarettes is of **Chinese origin**, with a concentration in the city of Shenzhen³.

2 Amounts

- According to various sources, UNITAR (the United Nations Institute of Training and Research) estimates **844 million e-cigarettes were discarded worldwide in 2022⁴**.
- 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 2020⁵.
 - **Belgium:** According to an enquiry of the University of Antwerp, an increasing number of adolescents, but also primary school kids consume e-cigarettes⁶.
 - **UK:** data from 2022 estimates that about 168 million disposable e-cigarettes are being bought annually in the country⁷. Estimating for that same year that 2 disposable e-cigarettes are being thrown away every second in the UK⁸, 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 units¹⁰; 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 country¹². 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 sector¹³).

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**¹⁴, also in Switzerland¹⁵.
- 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**¹⁶. This is corroborated by the Net'Leman from Mai 2024 which also observed an increased presence of disposable e-cigarettes among the collected litter¹⁷.
- 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**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 composition¹⁹. Also other research warns that **e-cigarettes present a rising environmental threat**²⁰.
- According to some sources, e-cigarettes potentially present an **even more serious environmental threat than classical cigarette filters**²¹.

4 Further problems

4.1 Waste

4.1.1 E-cigarette waste: general

- E-cigarettes do present a complex form of **e-waste**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 waste²³.
- **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 explosion²⁴.

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 year²⁵.
- **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 Cressier²⁶.

- 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**²⁷; but the FOEN does not have information and data on this²⁸.

4.2 Recycling

4.2.1 E-cigarette recycling: general

- Notwithstanding many nice (...) words and initiatives by the responsible industry²⁹, the composition of e-cigarettes composed of very different components difficult to separate makes them **very complex to recycle**³⁰. In practice, **e-cigarettes are little recycled**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 exist³²; as confirmed by the FOEN³³.
- 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 secrecy³⁴.
- In Switzerland, there is no standardized programme for recycling of e-cigarettes³⁵. The **SENS eRecycling foundation**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 recycled³⁷.

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 vehicles³⁸. 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 annually³⁹.
- Considering that one e-cigarette contains about 0.15 g of lithium⁴⁰, and that an average car battery contains about 8 kg of lithium⁴¹, 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 impacts⁴² and even in the absence of nicotine their health dangers should not be underestimated⁴³.

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**⁴⁴.
- In **87 other states**, e-cigarette sales are subject to restrictions, such as a ban on selling them online or on offering certain flavours⁴⁵.
- 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 them⁴⁶.
- Also China – while continuing to export them abroad⁴⁷ - is taking actions to regulate (disposable) e-cigarettes within its territory⁴⁸.
- 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 future⁴⁹.
- In the EU, **Belgium**, will prohibit disposable e-cigarettes as of 1 January 2025⁵⁰. The country has green light from the European Commission to do so. Also in **France** there are plans to do so⁵¹.

5.2 Switzerland

- The motions [23.3109](#) Clivaz and [23.3567](#) Klopfenstein Brogginini **call for a ban on disposable e-cigarettes**. Also the Interpellation [22.3211](#) by Laurence Fehlmann Riele 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 up⁵²”* (translated from French - tFF), and *“a ban would be disproportionate in view of the interference with freedom of trade and industry that it would represent⁵³”* (tFF).
- Different cantons have **banned the sale of e-cigarettes to minors**⁵⁴. 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 country⁵⁵.
- 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)⁵⁶.

¹ See. Wikipedia, [Juul](#).

² Swiss Association for Tobacco Control [SAfTC], [The electronic cigarette that refuses to go “Puff”](#) ; also: Velarde Crézé et al. (2023), [Nouvelles cigarettes électroniques jetables « puffs » : consensus d'expert-e-s sur leur réglementation](#), *Révue Médical Suisse*.

- ³ AP (19.12.2023), [Elf Bar and other e-cigarette makers dodged US customs and taxes after China's ban on vaping flavors](#). (referenced in SAfTC)
- ⁴ Planet Ark (23.10.2023), [Can Vapes be Recycled?](#); see also: Royal Society of chemistry - Chemistry World (13.10.2023), [Disposable vapes contribute to nearly \\$10 billion of 'invisible' e-waste every year.](#) – *Note that the original source has not been found.*
- ⁵ Planet Ark (23.10.2023), *op cit.*
- ⁶ De Redactie (24.05.2024), [Steeds meer jongeren vaperen, ook in lagere school: "Het wordt ervaren als onschuldig, bijna gezond tussendoortje"](#)
- ⁷ The Bureau of Investigative journalism (15.07.2022), [Rise of single-use vapes sending tonnes of lithium to landfill](#).
- ⁸ *Ibid.*
- ⁹ Material Focus (08.09.2023), [Number of disposable single-use vapes thrown away have in a year quadrupled to 5 million per week](#).
- ¹⁰ CDC Foundation (March 2023), [Data Brief - Monitoring U.S. E-Cigarette Sales: National Trends](#).
- ¹¹ *Ibid.*
- ¹² SENS eRecycling - Vape Recycler, [E-cigarettes – More than electronic waste](#).
- ¹³ Swiss Info (19.01.2024), [Up in smoke: what happens to disposable e-cigarettes?](#) > documentary RSI, 29'29". (interview with Michel Monteil, FOEN)
- ¹⁴ I.a. The Spinoff (17.10.2022), [The stratospheric rise of vape waste in Aotearoa](#); Reuters (10.10.2019), [Sun, sand and vape waste: A new type of litter piles up on American beaches](#);
- ¹⁵ Watson (28.09.2022), [La puff, cette « absurdité écologique » qui menace la Suisse](#).
- ¹⁶ *Ibid.*
- ¹⁷ RTS (26.05.2024), [Plus de puffs, mais moins de mégots retrouvés lors du nettoyage du lac Léman](#).
- ¹⁸ Truth initiative (February 2021), [A toxic, plastic problem. E-cigarette waste and the environment](#), p. 1/7. (referenced in SAfTC)
- ¹⁹ Ngambo et al. (2023), [A scoping review on e-cigarette environmental impacts](#), *Tobacco Prevention and Cessation*, October 2023, vol. 9.
- ²⁰ Pourchez et al. (2022), [From smoking to vaping: a new environmental threat?](#), *The Lancet Respiratory Medicine*.
- ²¹ Hale Hendlin, Yogi (2018), [Alert: Public Health Implications of Electronic Cigarette Waste](#), *American Journal of Public Health*, Vol. 108 (11); also: Truth initiative (February 2021), [A toxic plastic problem. E-cigarette waste and the environment](#), p. 2/7.
- ²² Senga Green et al. (2023), [Disposable e-cigarettes and cigarette butts alter the physiology of an aquatic plant Lemna minor \(Lemnaceae\)](#), *Science of the Total Environment*,
- ²³ EPA, Frequent Questions about the Management Standards for Hazardous Waste Pharmaceuticals and Amendment to the P075 Listing for Nicotine Final Rule > [Are e-cigarettes hazardous waste when discarded?](#)
- ²⁴ EPA (March 2018), [Lithium Ion Batteries in the Solid Waste System. SBWMA MRF Survey](#). (referenced in SAfTC) ; also: Public Health Law Center (16.11.2023), [We didn't start the fire: addressing hazards posed by e-cigarette waste](#).
- ²⁵ Swiss Info (19.01.2024), *op cit.*, 30'03". (interview with Michel Monteil, FOEN)
- ²⁶ RTS (23.07.2023), [Dans les centres de tri, les incendies liés aux batteries se multiplient](#). (referenced in SAfTC)
- ²⁷ Swiss Info (19.01.2024), *op cit.*, 06'30".
- ²⁸ *Ibid.*, 29'35". (interview with Michel Monteil, FOEN)
- ²⁹ See i.a. Goodvibe (21.05.2024), [Disposal of vapes in Switzerland - A detailed guide to the proper disposal of your e-cigarette](#); SENS eRecycling - Vape Recycler, [E-cigarettes – More than electronic waste](#).
- ³⁰ Royal Society of chemistry - Chemistry World (13.10.2023), *op cit.*; Impact solutions (12.07.2023), [The Challenges of Recycling Disposable Vapes](#).
- ³¹ 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?](#);
- ³² *Ibid.*, 22'00".
- ³³ *Ibid.*, 39'24".
- ³⁴ *Ibid.*, 26'35".
- ³⁵ Swiss Info (19.01.2024), *op cit.*, 18'30".
- ³⁶ <https://www.erecycling.ch/>
- ³⁷ Swiss Association for Tobacco Control, *op cit.*
- ³⁸ The Bureau of Investigative journalism (15.07.2022), *op cit.* (referenced in SAfTC)
- ³⁹ Material Focus (08.09.2023), *op cit.*
- ⁴⁰ 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.

⁴¹ Castelveccchi, Davide (2021), [Electric cars and batteries: how will the world produce enough?](#) *Nature*, Vol. 596, p. 337.

⁴² CDC, [Health Effects of Vaping](#); also: Lung Foundation Australia, [E-cigarettes and vaping. Unveil what you inhale](#); American Heart Association, [Is Vaping Better Than Smoking?](#)

⁴³ Korfei, Martina (2018), [The underestimated danger of E-cigarettes - also in the absence of nicotine](#), *Respiratory Research*, Vol. 19, 159; also: the University of North-Carolina at Chapel Hill (2018), [Why underestimating the health effects of vaping is a bad idea](#).

⁴⁴ Swiss Association for Tobacco Control, *op cit.*; also: ChemNovatic (08.03.2024), [The rise and fall of disposable vapes: understanding the changing trend](#).

⁴⁵ *Ibid.*

⁴⁶ Australian Government – Department of Health and Aged Care, [About vaping and e-cigarettes](#).

⁴⁷ Swiss Info (19.01.2024), *op cit.*, 41'00''; also: ZDF Magazin Royal (18.05.2024), [Rauchen für die Tonne: Einweg-Vapes](#), 16'12''.

⁴⁸ Tobacco Control Laws, [Legislation by country/ jurisdiction – China](#).

⁴⁹ Gov.UK (28.01.2024), [Press release - Disposable vapes banned to protect children's health](#); also: Gov.UK (29.01.2024), Blog The Education Hub - [Disposable vape ban and what it means for young people](#).

⁵⁰ RTBF (23.03.2024), [La vente de l'e-cigarette jetable interdite en Belgique dès le 1er janvier 2025](#); VRT (23.03.2024), [België verbiedt als eerste Europese land verkoop van wegwerp-e-sigaretten: "Voorkomen dat nieuwe generaties verslaafd raken"](#).

⁵¹ RTS (03.09.2023), [La France envisage d'interdire les cigarettes électroniques jetables, les "Puffs"](#).

⁵² Motion [23.3209](#) by Christoph Clivaz (09.03.2023), answer by the Federal Council.

⁵³ Interpellation [22.3211](#) by Laurence Fehlmann Riele (17.03.2022), answer by the Federal Council.

⁵⁴ Bundesamt für Gesundheit (Letzte Änderung 19.09.2023), [E-Zigaretten Politik in den Kantonen](#).

⁵⁵ Bundesamt für Gesundheit (Letzte Änderung 29.04.2024), [Neues Tabakproduktegesetz](#).

⁵⁶ Swiss Info (19.01.2024), *op cit.*, 35'15''. (interview with Michel Monteil, FOEN)