

# **Prohibition of the sale and supply of single-use vapes**

## **Strategic Environmental Assessment: Environmental Report**

**March 2024**

# 1 Non-technical summary

## 1.1 Introduction

The growing use of single-use vapes in Scotland has become a concern in recent years, in particular among young people and first-time smokers. The vapes market has grown enormously in recent years, including the use of single-use vapes.<sup>1</sup>

The Scottish Government's Programme for Government 2023-2024<sup>2</sup> included a commitment to "Take action to reduce vaping among nonsmokers and young people and to tackle the environmental impact of single-use vapes, including consulting on a proposal to ban their sale and other appropriate measures."

In January 2023, the Scottish Government commissioned Zero Waste Scotland to examine the environmental impact of single-use vapes. The research report, published in June 2023, highlighted environmental concerns including the increase of e-cigarette littering, waste of resources and the fire risk from batteries contained in devices, and identified possible policy options to address them.<sup>3</sup>

In October 2023, the Scottish Government, in partnership with the Department of Health and Social Care, the Department of Health (Northern Ireland), and the Welsh Government, published a UK-wide consultation<sup>4</sup> including proposals around restricting the sale and supply of single-use vapes. The consultation received nearly 28,000 responses.

The consultation feedback showed widespread support for banning the sale and supply of single-use (disposable) vapes. In Scotland, over 80% of respondents agreed that there should be restrictions on the sale and supply of single-use vapes, with a common theme of concern over their environmental impacts arising in the comments<sup>5</sup>. 73% of respondents believed that such restrictions should take the form of banning their sale and supply<sup>5</sup>.

In November 2023 the Scottish Government published its new Tobacco and Vaping Framework: roadmap to 2034<sup>6</sup>. One of the three themes underlying the framework is to identify what can be done to ensure vapes are used appropriately to support smoking cessation, but to deter take up where not used for quitting tobacco. Vapes should never be used by children and young people, however they are known to

---

<sup>1</sup> Use of e-cigarettes among adults in Great Britain. ASH, 2023

<sup>2</sup> Equality, Opportunity, Community: Our Programme for Government, Scottish Government, 2023

<sup>3</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single-use e-cigarettes. Hogg, D., 2023

<sup>4</sup> Creating a smokefree generation and tackling youth vaping. Department of Health and Social Care, The Scottish Government, Welsh Government, and Department of Health (Northern Ireland), 2023

<sup>5</sup> Creating a smokefree generation and tackling youth vaping consultation: government response. Department of Health and Social Care, The Scottish Government, Welsh Government, and Department of Health (Northern Ireland), 2023

<sup>6</sup> Stopping the start: our new plan to create a smokefree generation, Department of Health & Social Care, 2023

represent a significant proportion of the population who are using single-use devices.<sup>7</sup>

To address the environmental issues associated with single-use vapes, the Scottish Government has agreed with the UK Government (legislating for England) and the Welsh Government, to prohibit the sale and supply of such items (hereafter referred to as ban on single-use vapes or the ban). This includes both nicotine and non-nicotine containing products since the environmental concerns exist for both types of products. Northern Ireland officials acknowledge the issues raised during the consultation and will consider potential legislation in future. Reusable vapes will be unaffected by this change.

### Strategic Environmental Assessment

Strategic Environmental Assessment (SEA) is a statutory requirement under the Environmental Assessment (Scotland) Act 2005 ('the 2005 Act'), to assess the likely significant environmental effects that a public plan, programme, or strategy (PPS) will have on the environment if implemented. The process identifies how adverse environmental effects can be avoided, minimised, reduced, or mitigated and how any positive effects can be enhanced. It also allows the public to give their view on the programme and its potential environmental impacts.

SEA comprises the following key stages:

1. **Screening** – determining whether a Plan/Programme/Strategy (in this instance, the ban on the sale and supply of single-use vapes) requires an SEA. The Screening Report was issued to statutory consultees on 23 February 2024.
2. **Scoping** – establishing the scope and approach of the SEA, including the initial environmental topics to include, the context (a review of other plans, programmes, and strategies and the environmental baseline), and the assessment methodology, with the information presented in a Scoping Report, which is subject to a 5-week consultation. The Scoping Report was issued to statutory consultees on 23 February 2024.
3. **Environmental Assessment** – identifying, describing, and assessing the likely significant effects of the proposed policy.
4. **Environmental Report** – outlining the findings from the environmental assessment, consistent with the requirements of Schedule 3 of the 2005 Act. This report is the Environmental Report.
5. **Main consultation** – consulting on the draft policy alongside the Environmental Report;
6. **Post Adoption Statement (PAS)** – producing a statement to outline how the assessment and consultation responses have been considered within the finalised plan. This will be produced once the final version of the policy has been agreed and adopted.
7. **Monitoring** – monitoring the effects of implementation. This will be an ongoing exercise to determine the impacts of the proposal evaluate its success in achieving its aims.

The SEA approach has been amended where appropriate in response to the comments received from statutory consultees during the consultation period on the

---

<sup>7</sup> [Use of e-cigarettes \(vapes\) among young people in Great Britain](#). ASH, 2023

combined Screening and Scoping Reports. A summary of the responses received and corresponding actions taken is set out in Appendix A: Addressing Responses from Consultative Authorities.

## 1.2 Results

### 1.2.1 Summary of results

The impacts of the proposed policy identified in this assessment are summarised below:

Table 1 Summary of impacts against each environmental topic

| Climatic Factors | Biodiversity | Water | Human health | Soil | Air | Material Assets | Landscape and visual impacts |
|------------------|--------------|-------|--------------|------|-----|-----------------|------------------------------|
| ++               | +            | +     | +            | +    | +   | ++              | ++                           |

#### Key

|     |   |
|-----|---|
| ++  | Positive impacts                                |
| +   | Minor or uncertain positive impacts             |
| +/- | Uncertain or both positive and negative impacts |

### 1.2.2 Climatic Factors

Single-use vape consumption in Scotland is responsible for over 3,000 tonnes CO<sub>2</sub>e each year, and without intervention, this is set to increase to over 8,000 tonnes CO<sub>2</sub>e in the next three years<sup>8</sup>.

Banning the sale and supply of single-use vapes will significantly reduce their consumption and subsequent disposal in Scotland, leading to reductions in greenhouse gas emissions from incineration and waste fires.

Further avoided global greenhouse gas emissions are also anticipated outside Scotland, but are beyond the scope of this assessment.

### 1.2.3 Biodiversity

Banning the sale and supply of single-use vapes is expected to significantly reduce consumption and subsequent littering of such items, protecting habitats and species from potentially damaging contamination. Positive impacts may be offset to an extent by increased consumption of reusable vape packaging, such as refill containers, which could also enter the environment as litter. Prevalence of reusable vape components and packaging in the litter stream should be monitored.

<sup>8</sup> N.B. These figures include embodied carbon from the raw material extraction and production of single-use vapes.

### **1.2.4 Human health**

Human exposure to addictive and potentially harmful substances is expected to be reduced as a result of the proposed policy, though some potential risk was identified among former smokers and those trying to quit smoking. Reusable vapes are expected to significantly mitigate these risks, along with current smoking cessation support and offerings through the NHS.

A reduction in the risk to bystanders of second-hand inhalation will broaden the human health benefits if the ban results in an overall drop in vaping, though such impacts are not considered to be significant.

The health and safety risks of fires caused by lithium-ion batteries in the waste stream will also be reduced, owing to a smaller volume of single-use vapes being disposed of in the residual waste stream.

There will also be indirect secondary health benefits resulting from the wider environmental benefits such as a reduction of chemicals within e-liquids polluting soil and water and mental health benefits from improved landscapes and reduced littering.

Illegal trade of single-use vapes may mean that, while the human health risks described above are reduced, they will not be entirely eliminated.

### **1.2.5 Material Assets**

The proposed policy is anticipated to reduce consumption of the materials used to produce single-use vapes, for example, steel, plastic, lithium-ion batteries, and other metals. A shift towards reusable alternatives will reduce the amount of these materials discarded as waste in landfill, by incineration, or dropped as litter.

### **1.2.6 Landscape and visual impacts**

A reduction in availability of single-use vapes will result in a reduction in occurrences of vapes as litter, thus avoiding sightings of items in the environment that detract from the Scottish landscape.

### **1.2.7 Air**

The proposed ban is anticipated to result in minor improvements to air quality during the use phase of a single-use vapes' life cycle, and more notable improvements at the end-of-life stage. A reduction in single-use vapes in the residual waste stream will reduce the risk of waste fires occurring at facilities such as landfill sites, thus reducing the release of air pollutants such as particulate matter, nitrogen oxides, and sulfur oxides.

### **1.2.8 Water**

Banning the sale and supply of single-use vapes is expected to significantly reduce consumption and subsequent littering of such items, protecting habitats and species from potentially damaging contamination. Positive impacts may be offset to an extent by increased consumption of reusable vape packaging, such as refill containers, which could also enter the environment as litter. Prevalence of reusable vape components and packaging in the litter stream should be monitored.

### 1.2.9 Soil

Banning the sale and supply of single-use vapes is expected to significantly reduce consumption and subsequent littering of such items, protecting habitats and species from potentially damaging contamination. Positive impacts may be offset to an extent by increased consumption of reusable vape packaging, such as refill containers, which could also enter the environment as litter. Prevalence of reusable vape components and packaging in the litter stream should be monitored.

## 2 Introduction

### 2.1 Background

Vapes (also known as e-cigarettes) have increased in popularity in recent years, becoming more mainstream products.<sup>9</sup> In Scotland, the use of nicotine vapour products increased from 7% in 2019 to 10% in 2022.<sup>10</sup> This is also confirmed by data collected for the Smoking Toolkit Study which shows the use of nicotine products increased from 7.3% in Oct 2020 vs 9.5% in Oct 2023.<sup>11</sup> Specifically, usage of single-use vapes has increased, growing from 0.1 % to 4.9 % between January 2021 to August 2023 across the UK.<sup>12</sup>

Vapes can be a helpful tool to support smokers to quit, though research into the safety and effectiveness of e-cigarettes is still relatively new<sup>13</sup>. They are considered less harmful than smoking when smokers completely switch to vaping products. As they usually still contain nicotine they are not risk-free, and the long-term health impacts of vaping are unknown<sup>14</sup>. A 2024 Scottish Government briefing also concluded that vaping can cause health harms in non-smokers to which they would not otherwise have been exposed to. More research is required on dual use of both cigarettes and vapes. Data suggest this might pose the same of higher health risks than smoking cigarette alone.<sup>15</sup> They have also increased in prevalence amongst young people<sup>16</sup> and people who haven't traditionally smoked conventional cigarettes.<sup>17</sup>

An annual survey undertaken in 2023 by Action on Smoking and Health (ASH), looks at the smoking status and vaping behaviour amongst vapes users in Great Britain<sup>18</sup>. Findings from this research show that 56% of vape users are ex-smokers, 37% are current smokers and a smaller proportion are people who have never smoked. It also

---

<sup>9</sup> Use of e-cigarettes among adults in Great Britain. ASH, 2023

<sup>10</sup> The Scottish Health Survey 2022 – volume 1: main report. Scottish Government, 2023.

<sup>11</sup> Trends in electronic cigarette use in Scotland. Smoking in Scotland portal. Updated 18 January 2024.

<sup>12</sup> Who would be affected by a ban on disposable vapes? A population study in Great Britain. Sarah E. Jackson, Harry Tattan-Birch, Lion Shahab, Melissa Oldham, Dimitra Kale, Leonie Brose, Jamie Brown, 2024

<sup>13</sup> Vaping – Effectiveness as a cessation tool: evidence briefing. Scottish Government, 2024

<sup>14</sup> Vaping – Health harms: evidence briefing. Scottish Government, 2024

<sup>15</sup> *ibid*

<sup>16</sup> Use of e-cigarettes among young people in Great Britain, ASH, 2023

<sup>17</sup> Use of e-cigarette (vapes) among adults in Great Britain. ASH, 2023

<sup>18</sup> *ibid*

found that around two thirds of vape users' most popular main device was a reusable vape<sup>19</sup>, with 31% mainly using a disposable vape.

However, there has been a sharp increase in the use of single-use vapes in particular. Single-use vapes are defined as products that are not rechargeable (they use a battery which cannot be recharged, or a coil which cannot be replaced, including a coil contained in a single-use cartridge which is not separately available), or are not refillable (once empty, the cartridge or pod cannot be refilled or replaced), or are not rechargeable and not refillable.<sup>20</sup> In contrast, a reusable vape can both be recharged and fully refilled an unlimited number of times by the user, and will last for a longer period of time.

Single-use vapes tend to dominate the casual and beginner entry points of the market. Generalist retailers, including convenience stores, primarily sell single-use products whilst specialist vape stores tend to sell more reusable vapes and refill products.<sup>21</sup> Single-use vapes account for around 50% of the UK vape market. It has been estimated that 60% turnover by the vapes industry is generated from single-use vapes, in comparison to 40% from reusable vapes, refill cartridges and e-liquid.

There has been a surge in popularity in single-use vapes in recent years, especially among young people. The proportion of adults using single-use vapes increased from 0.1 % to 4.9 % between January 2021 to August 2023 across the UK. Last year (2022) a survey by ASH<sup>22</sup> showed that for the first time the most popular type of e-cigarette amongst GB youth was disposable (single use) e-cigarettes, with their use growing more than a 7-fold between 2020 and 2022 from 7.7% to 52%. Growth has continued since last year and 69% of children this year said this was the device they used most frequently.

Vapes should not be used by children, young people or non-smokers and carries an unknown long-term risk of future harm and can be very addictive<sup>23</sup> It is also an offence to sell vapes to anyone under the age of 18 in the UK. Despite the sale of vapes to those under the age of 18 being illegal, the recent Health Behaviour in School-Aged Children (Scotland) study reports that 3% of 11-year-olds, 10% of 13-year-olds and 25% of 15-year-olds said they had used a vape in the past 30 days. Purchasing from shops is the most common source. The report also found that there have been increases in current vape use since 2018 for 13-year-old girls (2% to 13%) and larger increases for 15-year-olds (girls 6% to 30% and boys 8% to 20%). They have also increased in prevalence amongst young people and people who haven't traditionally smoked cigarettes. Recent research suggests poor compliance

---

<sup>19</sup> 50% of users mainly used an 'electronic cigarette that is rechargeable and has a tank or reservoir that you fill with liquids' and 17% of users mainly used an 'electronic cigarette kit that is rechargeable with replaceable pre-filled cartridges'

<sup>20</sup> Vapes that are rechargeable and not refillable or that are refillable and not rechargeable, are still considered disposable or 'single-use' even though the lifetime of the vape can be extended through refilling or recharging it.

<sup>21</sup> Analysis of the Market for Vapes, Eunomia 2023

<sup>22</sup> Use of e-cigarettes among young people in Great Britain. ASH, 2023,

<sup>23</sup> [Vaping addiction soon takes hold](#). NHS Inform campaign, access online 15 March 2024



with the restriction of vape sales to those who are underage.<sup>24</sup> Products are available in a variety of flavours<sup>25</sup> (e.g. various fruit flavours, confectionery, soft drinks, etc.) with attractive packaging<sup>26</sup> which potentially increases the risk for children to find these products appealing. Research also suggests that the majority of vape users under 18 mainly used single-use vapes in 2023<sup>27</sup>. The report highlights that in 2023, 69% of respondents said the most frequently used device was a disposable (single-use) vape. This rate increased up from 52% in 2022 and 7.7% in 2021.

The rise in the use of single-use vapes has led to their increase in the waste stream. There has been growing concern over their environmental impact as they are typically littered or discarded as general waste in a bin rather than recycled. In 2023, it was estimated that almost 5 million single-use vapes were either littered or thrown away in general waste every week in the UK, almost four times as many as in the previous year.<sup>28</sup>

Single-use vapes which are thrown in a bin with general waste will either be landfilled or incinerated, and they also pose a fire risk for waste collection vehicles and waste transfer sites due to their lithium-ion batteries. Compaction during the collection process increases the chances of puncture and combustion, setting fire to dry and flammable waste or household recycling around them. This endangers the public and collection crews, as well as damaging public and private property. It is estimated that lithium-ion batteries are responsible for approximately 48% (over 200) of all waste fires occurring in the UK each year.<sup>29</sup>

When single-use vapes are littered, they introduce plastic, nicotine salts, heavy metals, lead, mercury, and flammable lithium-ion batteries into the natural environment.<sup>30</sup> The chemicals can end up contaminating waterways and soil and can also be toxic and damaging to wildlife. When single-use vapes which have a plastic casing are littered, the plastic can grind down into harmful microplastics. Single-use vapes are primarily littered in public spaces and this generates clean-up costs to local authorities.<sup>31</sup>

Vapes, like other electricals, should not be placed in a general waste bin or littered, and should instead be returned to participating stores or to household waste and recycling centres (HWRCs). Current estimates indicate that across the UK only 17%

---

<sup>24</sup> ASH Scotland's literature review for NHS Greater Glasgow and Clyde's Tobacco Planning and Implementation Group Review of current evidence: Young people and e-cigarettes September 2023

<sup>25</sup> Use of vapes among young people in Great Britain, ASH 2023

<sup>26</sup> Creating a smokefree generation and tackling youth vaping: what you need to know, Department of Health and Social Care, 2024

<sup>27</sup> Use of vapes among young people in Great Britain, ASH 2023

<sup>28</sup> Material Focus, 2023, Number of disposable single-use vapes thrown away have in a year quadrupled to 5 million per week

<sup>29</sup> Material Focus, 2022, Over 700 fires in bin lorries and recycling centres are caused by batteries many of which are hidden inside electricals

<sup>30</sup> Youth vaping: call for evidence Office for Health Improvement & Disparities, 2023

<sup>31</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single-use e-cigarettes Hogg, D., 2023,

of vape users correctly dispose of their single-use vapes.<sup>32</sup> In Scotland an estimated 12.8% of single-use vapes are taken back to participating stores, and 8.3% to household waste recycling centres.<sup>33</sup>

Single-use vapes are difficult and expensive to recycle.<sup>34</sup> The only recycling process available in the UK is manual dismantling which is costly and time consuming as most single-use vapes are not designed to be taken apart easily.<sup>35</sup> They are designed as one unit and require specific tools to remove the lithium-ion battery for recycling and careful handling of components to avoid operator exposure to the remaining e-liquid. Of the single-use vapes that are returned to a shop or recycling centre across the UK, it is estimated that only 1% are actually recycled due to limited recycling capacity.<sup>36</sup> The remainder of vapes collected for recycling are likely to be sent to landfill given the Environment Agency's guidance (applicable across the UK) that single-use vapes should not be incinerated.<sup>37</sup>

Environmental impacts from manufacturing single-use vapes are also a concern. A typical single-use vape contains plastic, copper, cobalt, and a lithium battery. Lithium and cobalt are critical raw materials as noted in the UK's Critical Raw Materials Strategy<sup>38</sup> which is essential to the production of electronic devices, batteries, and energy generation.<sup>39</sup> The increased demand for single-use vapes leads to an increased demand for these critical raw materials. It is estimated that the total amount of single-use vapes purchased every year contain enough lithium to provide batteries for 5,000 electric vehicles.<sup>40</sup> This is a waste of valuable resources in a product with a short lifespan, that is poorly recycled, and has a reusable alternative readily available. As well as a loss of resources, there are environmental impacts through raw material extraction, and single-use vape production and manufacturing. Most notably, this includes greenhouse gas emissions and water consumption generated in their manufacture.<sup>41</sup>

### 2.1.1 Wider policy context

The Scottish Government is committed to moving towards a circular economy, where we move from a "take, make and dispose" model to one where we value materials and keep them in use. Reusable vapes are a readily available alternative to single-use vapes and have a much longer lifespan. They are made from more durable

---

<sup>32</sup> [Number of disposable single-use vapes thrown away have in a year quadrupled to 5 million per week](#). Material Focus, 2023

<sup>33</sup> [Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single-use e-cigarettes](#). Hogg, D., 2023,

<sup>34</sup> Dismantling a growing problem. Valpak, 2023,

<sup>35</sup> Disposable vapes – a challenge to the recycling sector. IEMA, 2022,

<sup>36</sup> Analysis of the Market for Vapes, Eunomia, 2023

<sup>37</sup> Agency sets out vapes recycling stance, WastePack, 2023

<sup>38</sup> Resilience for the Future: The UK's Critical Raw Materials Strategy

<sup>39</sup> The Role of Critical Minerals in Clean Energy Transitions, World Energy Outlook. International Energy Agency, 2021

<sup>40</sup> Number of disposable single-use vapes thrown away have in a year quadrupled to 5 million per week. Material Focus media release, 2023

<sup>41</sup> Hogg, D., 2023, Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single-use e-cigarettes

materials and are built to last longer. Although they are initially more expensive<sup>42</sup>, reusable vapes are more cost-effective in the long term. Reusable vapes are considered to be less environmentally damaging, as the same vape can be used for an extended period of time compared to single-use vapes. This causes little change in consumer experience while reducing environmental impacts.

The Department of Health and Social Care published a call for evidence on youth vaping in April 2023<sup>43</sup> where the impact of vapes on the environment was a key theme of interest. A summary of responses to this call for evidence was published in October 2023, highlighting many of the key issues in relation to the damaging impact on the environment caused by single-use vapes.<sup>44</sup>

There are measures already in place to ensure responsible production and disposal of vapes. The Waste Electrical and Electronic Equipment (WEEE) Regulations 2013<sup>45</sup> aim to encourage the reuse and recycling of these items by placing financial responsibilities on producers and distributors of electrical and electronic equipment (EEE) to pay for the collection and disposal schemes for end-of-life products. This means that all producers who place EEE on the UK market, including producers of single-use vapes, are responsible for financing the costs of the collection, treatment, recovery, and environmentally sound disposal of WEEE.

Compliance with the current WEEE regulations by vape producers is estimated to be low. This includes low levels of awareness amongst store owners and distributors for takeback schemes, as well as low levels of customer participation reported.<sup>46</sup>

Plans to reform the producer responsibility system for waste electrical and electronic equipment<sup>47</sup> have recently been consulted on. Proposals under review include the provision of collection infrastructure for household WEEE financed by producers of electrical and electronic equipment; reforms to the take-back obligations that currently apply to distributors; obligations on online marketplaces; and creating a new separate categorisation for vapes to ensure producers of vapes properly finance recycling costs when they become waste. The reported low awareness of producer obligations ought to be addressed by the implementation of these producer responsibility reforms.

A new Vaping Products Duty will be introduced by the UK government in October 2026. A public consultation<sup>48</sup> is underway on this new duty and will close on 29 May 2024. It sets out the proposals for how the duty will be designed and implemented and will be accompanied by a one-off increase in tobacco duties.

---

<sup>42</sup> Creating a smokefree generation and tackling youth vaping: your views - GOV.UK ([www.gov.uk](http://www.gov.uk))

<sup>43</sup> Youth vaping: call for evidence. Office for Health Improvement & Disparities, 2023,

<sup>44</sup> Youth vaping: Summary of responses and government response. Department for Environment, Food, & Rural Affairs, 2023

<sup>45</sup> The Waste Electrical and Electronic Equipment Regulations 2013. UK Government, 2013,

<sup>46</sup> Number of disposable single-use vapes thrown away have in a year quadrupled to 5 million per week. Material Focus, 2023

<sup>47</sup> Consultation on reforming the producer responsibility system for waste electrical and electronic equipment 2023. Department for Environment, Food, & Rural Affairs, 2023,

<sup>48</sup> Vaping Products Duty Consultation, UK Government, 2024

## 2.2 What is Strategic Environmental Assessment?

Strategic Environmental Assessment (SEA) is a statutory requirement under the Environmental Assessment (Scotland) Act 2005<sup>49</sup> ('the 2005 Act'), to assess the likely significant environmental effects that a public plan, programme, or strategy (PPS) will have on the environment if implemented. The process identifies how adverse environmental effects can be avoided, minimised, reduced or mitigated and how any positive effects can be enhanced. It also allows the public to give their view on the programme and its potential environmental impacts.

SEA comprises the following key stages:

1. **Screening** – determining whether a Plan/Programme/Strategy (in this instance, the prohibition of the sale and supply of single-use vapes) requires an SEA. The Screening Report was issued to statutory consultees on 23 February 2024.
2. **Scoping** – establishing the scope and approach of the SEA, including the initial environmental topics to include, the context (a review of other plans, programmes, and strategies and the environmental baseline), and the assessment methodology, with the information presented in a Scoping Report, which is subject to a 5-week consultation. The Scoping Report was issued to statutory consultees on 23 February 2024.
3. **Environmental Assessment** – identifying, describing, and assessing the likely significant effects of the proposal.
4. **Environmental Report** – outlining the findings from the environmental assessment, consistent with the requirements of Schedule 3 of the 2005 Act. This report is the Environmental Report.
5. **Main consultation** – consulting on the draft policy alongside the Environmental Report.
6. **Post Adoption Statement (PAS)** – producing a statement to outline how the assessment and consultation responses have been considered within the finalised plan. This will be produced once the final version of the policy has been agreed and adopted.
7. **Monitoring** – monitoring the effects of implementation. This will be an ongoing exercise to determine the impacts of the policy and evaluate its success in achieving its aims.

The SEA approach has been amended where appropriate in response to the comments received from statutory consultees during the consultation period on the combined Screening and Scoping Reports. A summary of the responses received and corresponding actions taken is set out in Appendix A: Addressing Responses from Consultative Authorities.

## 3 Approach to the assessment

### 3.1 Scope of the assessment

This assessment considers the estimated impacts of the proposed ban on the sale and supply of single-use vapes across Scotland, assuming implementation from 1 April 2025.

---

<sup>49</sup> Environmental Assessment (Scotland) Act 2005

Table 2 sets out the environmental topics scoped into this assessment, as proposed in the Scoping Report. ‘Cultural heritage and the historic environment’ was scoped out of this assessment as no significant direct impacts are anticipated in relation to this topic.

Feedback from the consultation on the Scoping Report indicated that all statutory consultees were satisfied with the environmental topics proposed.

Table 2 Scope of environmental topics assessed

| <b>Biodiversity</b> | <b>Human health</b> | <b>Soil</b> | <b>Water</b> | <b>Air</b> | <b>Climatic Factors</b> | <b>Material Assets</b> | <b>Cultural heritage and the historic environment</b> | <b>Landscape and visual impacts</b> |
|---------------------|---------------------|-------------|--------------|------------|-------------------------|------------------------|---|-------------------------------------|
| In                  | In                  | In          | In           | In         | In                      | In                     | Out   | In                                  |

### 3.2 Environmental objectives

The anticipated impacts of the proposed policy have been assessed against each of the following environmental objectives, as set out in the Scoping Report and approved by the statutory consultees.

One additional objective has been added during the analysis stage of this assessment, as it was determined that additional impacts were likely under the ‘Air’ category which were not covered by the original objectives. These impacts relate to the air quality benefits from avoided waste fires. The human health objectives were broadened to cover secondary impacts from reduced vape use and the related environmental benefits.

#### 3.2.1 Climatic Factors

- Reduce greenhouse gas (GHG) emissions resulting from the disposal of single-use vapes, including the impacts of the embodied carbon in wasted vapes.

#### 3.2.2 Biodiversity

- Protect habitats and species in Scotland from damage resulting from littered single-use vapes.

#### 3.2.3 Human health

- Improve human health in Scotland through a reduction in the ease of use of single-use vapes for new smokers, and the associated health concerns;
- Reduce the risk to the general public from second hand inhalation of vapours and exposure to chemical pollution and litter caused by vapes; and
- Reduce the risk of harm to waste managers and members of the public resulting from fires caused by incorrectly disposed vapes.

#### 3.2.4 Material Assets

- Reduce consumption of virgin materials, including critical raw materials, used in vapes; and

- Reduce loss of materials to landfill, energy recovery, or litter in the form of discarded single-use vapes.

### **3.2.5 Landscape and visual impacts**

- Enhance the visual impact of Scotland's landscapes through a reduction in the volume of littered vapes in the environment.

### **3.2.6 Air**

- Contribute to improved air quality through the reduction in use of single-use vapes and resultant pollution from vapours; and
- Reduce the risk of air pollution caused by the disposal of waste vapes and the associated risk of waste fires.

### **3.2.7 Water**

- Protect waterways in Scotland from pollution resulting from littered single-use vapes e.g. from residual nicotine, additives, and microplastics.

### **3.2.8 Soil**

- Enhance soil quality in Scotland by reducing soil pollution from littered single-use vapes e.g. from residual nicotine, additives, and microplastics.

## **3.3 Consideration of reasonable alternatives**

The Environmental Assessment (Scotland) Act 2005 requires that reasonable alternatives be assessed.

This assessment considers the environmental impacts of the proposed ban against the following reasonable alternatives:

Option 1: Continue with existing commitments only:

i.e. do not implement a ban. Vapes will continue to be included under the upcoming reforms to WEEE EPR.

Option 2: Option 1 + Launch of an information campaign:

i.e. take a non-regulatory approach to encourage more responsible use and disposal of vapes, raising awareness of how they can be recycled.

These alternatives align with the shortlisted policy options identified by the Department for Environment, Food, and Rural Affairs (DEFRA) in their impact assessment of a ban on single-use vapes.

The following alternative policy options were among those considered at UK level, and a rationale provided as to why they would not be a suitable alternative to the preferred policy option and alternatives:

- Implementation of a deposit return scheme for single-use vapes: This option would involve deposits being placed on single-use vapes to incentivise recycling. This option could help with increasing recycling of single-use vapes and thereby reduce negative impacts on the environment. This option was deemed less likely to promote the use of reusable alternatives and would also take several years to implement, while the problem under consideration is growing rapidly. It was therefore concluded that this option was not likely to deliver the required outcomes at the pace needed to tackle the problem of growing single-use vape use, and is not

considered a reasonable alternative to banning the sale and supply of single-use vapes.

- Request-only option:  
This option would involve single-use vapes being available by request-only in all settings, but not readily on display (i.e. only made available if a consumer specifically asks for one). The impacts of this policy on reducing the usage of single-use vapes are uncertain and this in turn may not reduce the current environmental impacts being faced. It would also be more difficult for enforcement bodies to monitor compliance with this regulation and would likely have no effect on online consumption (where it is estimated 30-35% of consumers purchase vapes<sup>50</sup>). It was therefore concluded that this option does not offer a reasonable alternative to banning of the sale and supply of single-use vapes.
- Improved product design of single-use vapes for easier recyclability:  
A standardisation for the design and recycling of single-use vapes could ease the burden on recyclers and enable automation of the recycling process, as opposed to manual dismantling. However, any product standard would take time to develop, implement and enforce, potentially disrupting the availability of vape products to those who require them. This option also fails to promote the use of reusable alternatives to single-use vapes. Due to concerns over feasibility, this option was not considered a reasonable alternative to banning the sale and supply of single-use vapes.
- Tax on single-use vapes:  
The Scottish Government do not have the devolved powers to introduce a new tax in Scotland, and this option would only be feasible under UK legislation. The UK Government considered the introduction of a tax on single-use vapes in their long-list of policy options, concluding that, due to the risks and uncertainty over its sustained impact, it was not taken forward as a preferred option.
- Prescribing single-use vapes:  
The licensing and regulation of medicines in the UK is reserved to the UK Government and undertaken on their behalf by the Medicines and Healthcare Products Regulatory Agency (MHRA). That includes nicotine-containing products used for medicinal purposes, such as patches or lozenges. It is the MHRA (rather than a UK Government minister) that determines whether a medicine is available on the UK market: either only on prescription, or restricted sale through pharmacies, or for general sale at any retail outlet. There are currently no nicotine vapour products (NVPs) approved by the MHRA for prescription. Vapes cannot be offered on prescription unless and until the MHRA acted to licence an NVP. To achieve a licence, products need to meet the standards of quality, safety, and efficacy expected of medicinal products. If successful, this would allow products to be made available for prescription in Scotland. Approval of a licensed NVP to be prescribed by NHS healthcare professionals in Scotland would generally be achieved through an application to the Scottish Medicines Consortium (SMC), and if recommended for use, consideration by the local Area Drug and Therapeutic Committees of the NHS Boards. However, without a company successfully applying for a licence for their NVPs to be put on a prescription basis the Scottish

---

<sup>50</sup> Analysis of the Market for Vapes. Eunomia, 2023

Government does not have a route to put vapes on prescription and cannot act to make vapes (or single use vapes) prescription-only.

Feedback on the Scoping Report suggested that the Consultation Authorities were content with the proposed approach to the consideration of reasonable alternatives.



### 3.4 Environmental Principles

The assessment in this SEA will follow the guiding principles in section 13(1) of the UK Withdrawal from the European Union (Continuity) (Scotland) Act 2021 (the Continuity Act). These principles are:

- The principle that protecting the environment should be integrated into the making of policies.
- The precautionary principle as it relates to the environment.
- The principle that preventative action should be taken to avert environmental damage.
- The principle that environmental damage should as a priority be rectified at source.
- The principle that the polluter should pay.

The assessment objectives encompass the principles that environmental damage should be prevented or reduced by the policy in question. The assessment highlights any outcomes of the proposed policy that may be expected to cause environmental damage.

The proposal itself is guided by many of the principles. It is being designed with the aim of protecting the environment from the negative impacts of single-use material consumption and waste. The proposal is guided by the principles of taking preventative action to avert environmental damage and the rectification of impacts at source; seeking to address the environmental impacts of single-use vapes by reducing their consumption in the first instance.

### 3.5 Assessment Methodology

This SEA has been undertaken on a topic-by-topic basis to allow the potential for environmental impacts under each of the in-scope environmental topic to be explored separately. The overarching aim of this assessment was to analyse each relevant topic in order to identify, describe, and evaluate (where possible) the likely significant environmental effects – both positive and negative – that could arise from the implementation of the proposed ban of single-use vapes.

A review of relevant literature was undertaken to draw insight from existing reports, life cycle assessment studies, and other relevant work in this area. Data collected on the environmental impacts of single-use vapes was combined with the best available estimates of the current volume of items placed on the Scottish market, and the resultant impacts the proposal is expected to cause in Scotland.

As well as a reduction in legal sales of single-use vapes in Scotland, this assessment takes into consideration some potential unintended consequences. For example, a potential increased demand for illegally sold single-use vapes, and the increase in use of reusable vapes and their refill containers. Where data was not available to quantify such impacts, qualitative exploration of potential outcomes has been included instead.

The following key considerations will be used to inform the assessment:

- Consultation with the consultative authorities (SEPA, NatureScot and Historic Environment Scotland) and other relevant stakeholders.
- Relevant contextual information including a review of associated PPS, the regulatory framework, and the environmental baseline.
- The nature of the potential effect (what is expected to happen).
- The timing and duration of the potential effect (e.g. short, medium or long term).
- The geographic scale of the potential effect (e.g. local, regional, national).
- The location of the potential effect (e.g. whether it affects rural or urban communities).
- The potential effect on vulnerable communities or sensitive habitats (e.g. terrestrial or marine).
- The reasons for whether the effect is considered significant or not.
- The reasons for any uncertainty, where this is identified.
- The potential to avoid, minimise, reduce, mitigate, or compensate for the identified effect(s) with evidence (where applicable).

Where the baseline data has been slight, uncertain, or incomprehensive, the best available information together with professional assumptions and judgement will be utilised to assess the anticipated significant effects of introducing the proposed policy.

The results from this exercise will be considered against the environmental objectives suggested above, and the extent to which they are likely to be met will be discussed. Secondary, cumulative, and synergistic effects will also be considered at this stage.

The process should enable key issues associated with the Scottish Government's proposal to ban the sale and supply of single-use vapes to be explored in relation to the environmental topic areas and the relevant environmental objectives.

The report will then explore mitigation options for any negative impacts identified, and, where appropriate, offer suggestions on maximising environmental benefits identified in the assessment. For example, the assessment will consider the potential impacts of increased consumption, disposal, and potentially littering, of refill containers for reusable vapes. Some suggestions are provided to help determine the best approach to the monitoring and evaluation of the environmental benefits of the policy.

## 4 Environmental baseline and related PPS

### 4.1 Baseline consumption of single-use vapes

The report commissioned by Zero Waste Scotland<sup>51</sup> estimated that between April 2022 and April 2023, between 21 and 26 million single-use vapes were consumed in Scotland, along with between 800 and 1000 tonnes of packaging from single-use vapes. The report found that the market for single-use vapes was growing quickly, with sales doubling in six months between October 2022 and March 2023.

### 4.2 PPS related to vapes

#### 4.2.1 Scottish and UK Commitments

The Scottish Government's Programme for Government 2023-2024<sup>52</sup> includes a commitment to take action to reduce vaping among non-smokers and young people and to tackle the environmental impact of single-use vapes, including consulting on a proposal to ban their sale and other appropriate measures.

In November 2023 the Scottish Government published its new Tobacco and Vaping Framework: roadmap to 2034<sup>53</sup>. One of the three themes underlying the framework is product, specifically what can be done to ensure vapes are used appropriately to support cessation but deter take up where not used for quitting tobacco. These devices should never be used by children and young people, who are known represent a significant proportion of the population who are using these devices.

Evidence on the long-term harms of vaping and on the effects of vaping on young people is still emergent. As such, a precautionary approach has been adopted by the Scottish Government with an objective to protect public health and prevent nicotine addiction and other known potential health harms deriving from the use of vaping products.<sup>54</sup> This is especially relevant to children, young people and non-smokers.

In October 2023, the UK Government published 'Stopping the start: our new plan to create a smokefree generation'<sup>55</sup> which included proposals to tackle youth vaping and to restrict the sale of single vapes. Following this, the Scottish Government, alongside the UK Government, Welsh Government and the Northern Ireland Department of Health and Department of Agriculture, Environment and Rural Affairs, published a UK-wide consultation which received nearly 28,000 responses.

The consultation feedback showed widespread support for banning the sale and supply of disposable vapes. Almost 80% of respondents agreed that there should be

---

<sup>51</sup> [Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single-use e-cigarettes, Dominic Hogg, 2023](#)

<sup>52</sup> [Equality, Opportunity, Community: Our Programme for Government, Scottish Government, 2023](#)

<sup>53</sup> [Tobacco and Vaping Framework: roadmap to 2034, Scottish Government, 2023](#)

<sup>54</sup> [Vaping – Health harms: evidence briefing](#). Scottish Government, 2024

<sup>55</sup> [Stopping the start: our new plan to create a smokefree generation, Department of Health & Social Care, 2023](#)

restrictions on the sale and supply of disposable vapes, with a common theme of concern over their environmental impacts arising in the comments<sup>56</sup>. 69% of respondents believed that such restrictions should take the form of banning their sale and supply<sup>57</sup>.

A new Vaping Products Duty will be introduced by the UK government in October 2026. A public consultation<sup>58</sup> is underway on this new duty and will close on 29 May 2024. It sets out the proposals for how the duty will be designed and implemented and will be accompanied by a one-off increase in tobacco duties.

#### 4.2.2 International legislation

In the European Union (EU), the Regulation (EU) 2023/1542 of the European Parliament and of the Council concerning batteries and waste batteries (the new Batteries Regulation) requires that portable batteries in products (such as disposable e-cigarettes), must be readily removable and replaceable by the users themselves with very limited exception. Single-use vapes not meeting these requirements will be prevented from being placed on the market in the EU as of 18 February 2027.<sup>59</sup>

The French government is considering a ban on single-use vapes amid health and environmental concerns, likely to come into effect by September 2024. Belgium authorities have also decided to ban single-use vapes expected to come into effect from 1 January 2026. Ireland and Germany are also considering bans on single-use vapes due to their concerns about environmental impacts and disposal issues.<sup>60</sup>

The sale of all e-cigarettes (vapes) with a flavour other than tobacco is banned in Finland, and restrictions apply to advertising and promotion at points of sale.<sup>61</sup> In Norway, sales of e-cigarettes and e-liquids are restricted to instances where the product has been approved by the Directorate of Health. Domestic sale of flavoured vapes is also banned in China, though their manufacture for export is permitted.<sup>62</sup>

New Zealand introduced a ban on single-use vapes in 2023 whereby manufacturers, importers, distributors, and retailers must only sell single-use vaping products that have a removable battery, a child safety mechanism, follow new nicotine concentration requirements, and comply with new labelling requirements<sup>63</sup>. Further restrictions include limiting vape products and their packaging to only allow generic

---

<sup>56</sup> [Creating a smokefree generation and tackling youth vaping consultation: government response, Department of Health \(Northern Ireland\), Department of Health & Social Care, Scottish Government, and Welsh Government, 2024](#)

<sup>57</sup> Creating a smokefree generation and tackling youth vaping consultation: government response, Department of Health and Social Care, The Scottish Government, Welsh Government, and Department of Health (Northern Ireland), 2023

<sup>58</sup> Vaping Products Duty Consultation, UK Government, 2024

<sup>59</sup> Regulation (Eu) 2023/1542 of the European Parliament and of the Council of 12 July 2023 Concerning Batteries and Waste Batteries, Amending Directive 2008/98/Ec, Official Journal of the European Union, 2023

<sup>60</sup> Disposable vapes FAQs, Local Government Association, 2024

<sup>61</sup> Tobacco Control Laws - Bans on e-cigarettes, Finland. Live Search

<sup>62</sup> Tobacco Control Laws - Bans on e-cigarettes, China. Live Search

<sup>63</sup> Vaping, herbal smoking and smokeless tobacco products regulation, New Zealand Ministry of Health, 2024.

flavour descriptions and prohibiting new specialist vape shops from opening in the immediate vicinity of schools.

Australia has also taken action to limit the use of vapes through stronger legislation, enforcement, education, and support. From October 2021, a prescription is required to lawfully access vapes containing nicotine in Australia<sup>64</sup> and imports of single-use vapes were banned from January 2024.

Other countries, such as Qatar and Singapore, banned the use of vapes in their entirety, whereby the possession or sale of them can result in a penalty fine. More information on international legislation restricting the sale and supply of vapes is provided on the Tobacco Control Laws website<sup>65</sup>.

### **4.2.3 Persistent Organic Pollutants**

Persistent Organic Pollutants (POPs) are organic chemical substances which pose a risk to human health and the environment due to their persistence in the environment, bioaccumulation through the food chain, and long-range environmental transport across a wide geographical range<sup>66</sup>. The Stockholm Convention<sup>67</sup> plays a crucial role in safeguarding human health and the environment from the impacts of POPs. The Stockholm Convention aims to reduce or eliminate the release of POPs.

The UK's obligations under the Stockholm Convention are implemented by Regulation (EU) 2019/1021 of the European Parliament and of the Council on persistent organic pollutants, which is assimilated law, and the Persistent Organic Pollutants Regulations 2007<sup>68</sup>, with enforcement carried out by the Scottish Environment Protection Agency (SEPA) in Scotland. SEPA have issued guidance<sup>69</sup> on how to responsibly dispose of WEEE containing POPs. SEPA expects that the majority of WEEE should already be classified and consigned as special waste due to the presence of hazardous substances and/or including POPs. In the absence of such an assessment, SEPA advises that a precautionary classification of 'hazardous waste and POP waste' status should be adopted. Vapes are classified under Category 7 of this guidance: 'Toys, leisure and sporting equipment containing POPs'.

## **4.3 Waste and circular economy PPS**

### **4.3.1 UK Emissions Trading Scheme**

The Scottish Government is working with other nations in the UK on the expansion of the UK Emissions Trading Scheme (ETS) to include incineration and energy from

---

<sup>64</sup> About vaping and e-cigarettes, Department of Health and Aged Care, Australian Government, 2023.

<sup>65</sup> Tobacco Control Laws - Bans on e-cigarettes, Live Search

<sup>66</sup> SEPA Guidance: Classification of WEEE – Hazardous Substances and Persistent Organic Pollutants (POPs), SEPA, 2022

<sup>67</sup> The Stockholm Convention, United Nations Environment Programme, 2019

<sup>68</sup> The Persistent Organic Pollutants Regulations 2007, UK Government, 2007

<sup>69</sup> Classification of WEEE – Hazardous Substances and Persistent Organic Pollutants (POPs), SEPA, 2022

waste. The UK ETS Authority held a joint consultation<sup>70</sup> in 2022. A joint UK response<sup>71</sup> set out that inclusion of incineration and energy from waste in the UK ETS could facilitate reductions in emissions and increased efficiency of these processes by, for example, incentivising increases in recycling and investments in mixed waste sorting, heat networks and carbon capture and storage. The response noted an intention to include incineration and energy from waste in the UK ETS from 2028, but noted further work was needed on several areas ahead of a further consultation. Components of single-use vapes (and reusable vapes at the end of their usable lives) may be required to be incinerated due to their POPs content. Waste managers dealing with end-of-life vapes will therefore be affected by the potential inclusion of energy from waste in the UK ETS scheme.

### **4.3.2 Circular Economy**

The Circular Economy (Scotland) Bill<sup>72</sup> as introduced, includes measures to establish a legislative framework to support Scotland's transition towards a circular economy. The Bill includes provisions to require Scottish Ministers to publish a strategy for a circular economy every 5 years and enables regulations to impose circular economy targets on the Scottish Ministers. Additional provisions in the Bill include:

- A power to make regulations restricting the disposal of unsold consumer goods.
- Giving local authorities new powers and responsibilities for collection of household waste, including a power for Scottish Ministers to set household waste recycling targets for local authorities.
- Providing additional enforcement powers in relation to the householder duty of care, household waste requirements and littering from vehicles.
- Providing additional enforcement powers to SEPA and local authorities in relation to other waste crimes.
- A power to require the information as to waste and surplus be made available.
- Powers to introduce charges for single-use items such as coffee cups.

The Circular Economy (Scotland) Bill is currently at Stage 2<sup>73</sup>.

The Bill aims to accelerate Scotland's journey towards a circular economy, and the proposed ban on the sale and supply of single-use vapes aligns with this ambition by phasing out single-use items and encouraging the adoption of reusable alternatives.

The Scottish Government launched a consultation on Scotland's Circular Economy and Waste Route Map to 2030<sup>74</sup> in January 2024. The Route Map sets out how

---

<sup>70</sup> Developing the UK Emissions Trading Scheme (UK ETS), UK Government, 2022

<sup>71</sup> Developing the UK Emissions Trading Scheme: Main Response, UK Government, the Scottish Government, the Welsh Government and the Department of Agriculture, Environment and Rural Affairs for Northern Ireland, 2023

<sup>72</sup> Circular Economy (Scotland) Bill, The Scottish Parliament, 2023

<sup>73</sup> *ibid*

<sup>74</sup> Consultation on reforming the producer responsibility system for waste electrical and electronic equipment 2023, Department for Environment, Food, & Rural Affairs, 2023

Scotland should deliver its circular economy ambitions, making use of the new powers included in the Circular Economy (Scotland) Bill.

Measures in the Route Map are grouped under four strategic aims, which reflect the span of the waste hierarchy:

1. Reduce and reuse.
2. Modernise recycling.
3. Decarbonise disposal.
4. Strengthen the circular economy.

The first strategic aim of the Route Map consultation<sup>75</sup> includes a commitment to 'consult on actions regarding the environmental impacts of single-use vapes'.

### **4.3.3 Extended Producer Responsibility**

The Waste Electrical and Electronic Equipment (WEEE) Regulations 2013 aim to encourage the reuse and recycling of WEEE by placing financial responsibilities on producers and distributors of electrical and electronic equipment (EEE) to pay for collection and disposal schemes for end-of-life products. This means that all producers who place EEE on the UK market, including producers of single-use vapes, are responsible for financing the costs of the collection, treatment, recovery, and environmentally sound disposal of WEEE.

The Scottish Government, together with the UK and Welsh Governments and the Department of Agriculture, Environment and Rural Affairs in Northern Ireland, intend to reform the current producer responsibility for WEEE. This reform will make it easier for people to dispose responsibly of WEEE and ensure that producers of these products take full responsibility for their responsible management at end of life. The plans for these reforms have recently been consulted on<sup>76</sup>.

The recently closed consultation proposed action on vaping products, specifically 'to create a new discrete category of equipment for vapes'. Currently, vapes are included in the category (7) for 'toys, leisure and sports equipment'.

By creating a new category for vapes it will help ensure that vapes producers are contributing more to the full cost of separate collection and recycling of waste vapes. It will remove the risk of other existing Category 7 producers subsidising the cost of collection and treatment of vapes. It will also remove risks to Producer Compliance Schemes of incurring costs associated with vape collection and recycling that are disproportionate to their members' market share of the vapes placed on the UK market.

---

<sup>75</sup> Scotland's Circular Economy and Waste Route Map to 2030 Consultation. Scottish Government, 2024

<sup>76</sup> Consultation on reforming the producer responsibility system for waste electrical and electronic equipment 2023, Department for Environment, Food, & Rural Affairs, 2023

#### 4.4 Climatic Factors

The Climate Change (Scotland) Act 2009<sup>77</sup> ('The 2009 Act') sets out Scotland's commitment on tackling climate change. The 2009 Act sets out the statutory framework for greenhouse gas emissions reduction in Scotland and set targets for reduction in emissions of the seven Kyoto Protocol greenhouse gases by 80% by 2050, compared to the 1990/1995 baseline level. The 2009 Act was amended in 2019 through The Climate Change (Emissions Reduction Targets) (Scotland) Act ('the 2019 Act')<sup>78</sup>. The 2019 Act set targets to reduce Scotland's emissions of all greenhouse gases to net-zero by 2045 at the latest, with interim targets for reductions of at least 56% by 2020, 75% by 2030, 90% by 2040. The 2019 Act also requires that annual greenhouse gas emissions targets are set, by Order, for each year in the period 2021-2045. Following the initial phase of target-setting, the annual targets are set in nine-year batches.

The Handbook of Climate Trends Across Scotland<sup>79</sup> shows that the effects of climate change are already being felt in Scotland. Although the effects and severity of climate change is expected to vary by location, there is considerable evidence in the literature to support that significant changes in precipitation, snowfall, seasonality, cloud cover, humidity, wind speeds, soil moisture, rising sea levels and other extreme weather events may occur. The significant climate change impacts of material consumption and waste, along with the critical mitigating impact of resource efficient, circular economy policies have been firmly established in academic literature. Zero Waste Scotland's report The Carbon Impacts of the Circular Economy (2015)<sup>80</sup> estimates that over two thirds of Scotland's carbon footprint are directly related to material consumption and, to a lesser extent, waste.

The Scottish Waste Environmental Footprint Tool<sup>81</sup> found that, in 2022, discarded equipment (mainly consisting of waste electronic and electrical equipment) was among the top five highest contributors to climate change of all household waste categories. However, it should be noted that the majority of these impacts are generated during the production stage, and therefore not likely to occur in Scotland. Impacts originating outside Scotland are out of scope of this assessment.

This assessment will focus on how a ban on the sale of single-use vapes is expected to contribute to changes in Scotland's territorial greenhouse gas emissions through a reduction in consumption and disposal of single-use vapes in favour of reusable alternatives. The assessment will also consider the embodied carbon impacts of wasted single-use vapes.

---

<sup>77</sup> Climate Change (Scotland) Act 2009, UK Government, 2009

<sup>78</sup> Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, UK Government, 2019

<sup>79</sup> A handbook of climate trends across Scotland, Sniffer, 2006

<sup>80</sup> The Carbon Impacts of the Circular Economy, Zero Waste Scotland, 2015

<sup>81</sup> Scottish Waste Environmental Footprint Tool, Zero Waste Scotland, 2024 (not yet published at time of writing)



## 4.5 Biodiversity

Scotland's Biodiversity Strategy for 2045 (2020)<sup>82</sup> lays out the Scottish Government's plan for a 'nature positive' Scotland by 2045. The document defines nature positive as 'reversing the downward curve of biodiversity loss so that levels of biodiversity are once again increasing, bending the curve of biodiversity loss' within Scotland's borders. The strategy lists a set of outcomes that cover various environments including land and seascapes, rivers, lochs, wetlands, and coastal areas. The strategy also includes a list of priority actions for 2030, which are split into the following categories:

1. Accelerating restoration and regeneration.
2. Expanding and connecting protected areas and improving their condition.
3. Nature-friendly farming, fishing and forestry.
4. Recovering and protecting vulnerable and important species; and
5. Investing in nature.

Litter can negatively impact biodiversity through entanglement and ingestion. Plastics in the environment can also act as vector for other pollutants<sup>83</sup>. Plastic litter is estimated to lead globally every year to the mortality (either directly or indirectly) of one million seabirds, 100,000 marine mammals, including 30,000 seals and 100,000 turtles, either through entanglement or ingestion<sup>84</sup>. These impacts can negatively affect species' ability to hunt, avoid predators and reproduce. This can result in deficiencies in a habitat's ability to host a variety of individual species and provide nesting sites. These impacts will influence the services the ecosystem can provide for human populations, such as food production and carbon sequestration.

This assessment will seek to determine whether the proposed ban will impact on the Scottish Government's plans for a nature positive Scotland or impact Scotland's biodiversity through changing levels of litter resulting from the sale and use of single-use vapes.

## 4.6 Human Health

While vapes are known to have some benefits when used to help smokers quit smoking tobacco, there are concerns over the health implications for non-smokers and young people taking up the use of vapes<sup>85</sup>.

The Health Behaviour in School-Aged Children report<sup>86</sup> finds that 3% of 11-year-olds, 10% of 13-year-olds and 25% of 15-year-olds said they had used an e-cigarette in the past 30 days. The report also found that there have been increases in current use of vapes among children since 2018.

---

<sup>82</sup> Scottish Biodiversity Strategy to 2045, Scottish Government, 2022

<sup>83</sup> Microplastics as vectors of other contaminants: Analytical determination techniques and remediation methods, Zambrano-Pinto et al., 2024

<sup>84</sup> Marine Litter Issues, Impacts and Actions, Marine Scotland, 2011

<sup>85</sup> Tobacco and Vaping Framework: Roadmap to 2034. Scottish Government, 2023

<sup>86</sup> Health Behaviour in School-aged Children (Scotland). University of Glasgow, 2022

While existing research suggests that vaping is less harmful than smoking cigarettes, the long-term health effects are not yet fully understood<sup>87</sup>. The World Health Organization advises that electronic nicotine delivery systems (such as vapes) are addictive and not without harm and should be strictly regulated for maximum protection of public health<sup>88</sup>.

Vapes can be harmful to health, particularly for non-smokers and children, adolescents, and young adults, and their effects on many important health outcomes are uncertain<sup>89</sup>. Further research is needed into the health impacts of vaping and the safety and efficacy of vapes as a smoking cessation tool.

Vapes which are littered or incorrectly disposed of are also a potential fire risk. Members of the public and waste workers are put at risk of injury from fires caused by lithium-ion batteries<sup>90</sup>. A ban on single-use vapes is expected to reduce (but not eliminate) the risk of battery fires and the resultant potential for damage and injury.

There may also be positive impacts on mental health and wellbeing if the ban is successful in achieving a reduction in litter. The Scottish Litter Survey<sup>91</sup> found that the effects of litter on local residents' health and wellbeing was among respondents' top three concerns, ranking third after the impact on animals and the environment and negative perceptions of the neighbourhood. Furthermore, the Carnegie Trust found that those who reported the highest incidence of environmental incivilities such as litter were more likely to report anxiety, depression, poor health, smoking, and poor exercise than those with more positive views on this aspect of their local environment<sup>92</sup>. Another study<sup>93</sup> investigated the effect of litter on psychological reactions to marine environments. The study found that photographs of un-littered coasts tended to provide participants with a sense of happiness and less stress while photographs exhibiting littered coasts caused participants to exhibit stress and a lack of the positive psychological benefits that coastal environments normally provide.

#### 4.7 Material Assets

One of the proposed objectives for this assessment is to reduce loss of materials as litter. The 2023 Scottish Litter Survey found that single-use vapes are the fastest growing litter item, with half of survey respondents reporting that sightings of these have become more common in the past 12 months<sup>94</sup>.

---

<sup>87</sup> Vaping – Health harms: evidence briefing. Scottish Government, 2024

<sup>88</sup> WHO report on the global tobacco epidemic. World Health Organization, 2021

<sup>89</sup> [Electronic cigarettes and health outcomes: umbrella and systematic review of the global evidence, Banks et al., 2023](#)

<sup>90</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single-use e-cigarettes. Dominic Hogg, 2023

<sup>91</sup> Scottish Litter Survey. Keep Scotland Beautiful, 2023

<sup>92</sup> Pride in Place: Tackling Incivilities. Carnegie Trust UK, 2012

<sup>93</sup> Factors That Can Undermine the Psychological Benefits of Coastal Environments: Exploring the Effect of Tidal State, Presence, and Type of Litter. Wyles et al., 2016

<sup>94</sup> Scottish Litter Survey. Keep Scotland Beautiful, 2023

The National Litter and Flytipping Strategy<sup>95</sup> was published in June 2023 and seeks to build on the progress made since ‘Towards a Litter-Free Scotland’<sup>96</sup> was published in 2014 to tackle litter and flytipping in Scotland and acknowledges the wider context of the circular economy and Scotland’s net zero aims. The strategy will cover three broad themes: behaviour change, services and infrastructure, and enforcement.

The UK’s Critical Minerals Strategy<sup>97</sup>, published in 2022, sets out an approach to improve the resilience of critical mineral supply chains to increase the security of supply and action plan to best conserve critical raw materials. The strategy commits Defra to explore regulatory interventions to promote reuse, recycling, and recovery of critical minerals. Critical minerals include lithium to make batteries for many electrical items, including vapes. The resources used to make disposable vapes (e.g. oil for plastic casing and metals like copper and lithium) could be used for other purposes such as in the manufacture of other products, like lithium being used in the creation of batteries for electric vehicles.

The Scottish Waste Environmental Footprint Tool<sup>98</sup> found that, in 2022, discarded equipment (mainly consisting of waste electronic and electrical equipment) was by far the largest contributor to mineral resource scarcity of all household waste categories, meaning a reduction in generated WEEE could help to reduce depletion of key metal resources such as lithium and cobalt.

This assessment will seek to determine how a ban on the sale of single-use vapes will help to reduce consumption of virgin materials, reduce waste, and preserve critical raw materials currently lost to the economy either as litter or in the residual waste stream.

#### 4.8 Landscape and visual impacts

The Fourth National Planning Framework<sup>99</sup> was adopted by the Scottish Ministers on 13 February 2023, following approval by the Scottish Parliament in January. The Framework sets out a national spatial strategy for Scotland, including spatial principles, regional priorities, national developments, and national planning policy. The strategy will be relevant to wider policies and strategies relating to land use. The framework recognises the significant progress required to reach Scotland’s Net Zero goals. It will require new development and infrastructure across Scotland, as well as adaptation to the impacts of climate change that are already locked in. This includes increased flood risk, water scarcity, environmental change, coastal erosion, impacts on forestry and agriculture, extreme weather events, and risks to health, food security and safety.

The Fourth National Planning Framework has been included in the landscape and visual impacts section of this assessment. It should however be noted that it will also

---

<sup>95</sup> National Litter and Flytipping Strategy. Scottish Government, 2023

<sup>96</sup> Towards a Litter-free Scotland. Scottish Government, 2014

<sup>97</sup> UK Critical Mineral Strategy, UK Government, 2022

<sup>98</sup> Scottish Waste Environmental Footprint Tool. Zero Waste Scotland, 2024

<sup>99</sup> The Fourth National Planning Framework. Scottish Government, 2023

be relevant in areas such as biodiversity and climatic factors, and will additionally be considered in relation to these areas.

NatureScot's Landscape Policy Framework<sup>100</sup> describes an overarching aim "To safeguard and enhance the distinct identity, the diverse character and the special qualities of Scotland's landscapes as a whole, so as to ensure tomorrow's landscapes contribute positively to people's environment and are at least as attractive and valued as they are today." Keeping these environments free from litter and damaging chemicals will help to protect and enhance the natural beauty of such landscapes.

The 2023 Scottish Litter Survey found that single-use vapes are the fastest growing litter item, with half of survey respondents reporting that sightings of these have become more common in the past 12 months<sup>101</sup>.

This assessment will seek to determine whether the proposed ban will contribute to enhancing the visual impact of Scotland's landscapes through a reduction in the volume and nature of litter in Scottish landscapes.

#### 4.9 Air

The Air Quality Standards (Scotland) Regulations 2010<sup>102</sup> transpose the air quality environmental protection objectives from the European Air Quality Directive (2008)<sup>103</sup> into the Scottish context, and further air quality matters are set in the Environment Act 1995<sup>104</sup>. These objectives are aimed at reducing harmful air pollution and monitoring air quality, with a focus on areas where air pollution is concentrated.

The Pollution Prevention and Control (Scotland) Regulations 2012<sup>105</sup> provide the framework for the permitting of many industrial activities by SEPA and the setting of permit conditions, including limits on emissions. At UK level, the Air Quality Strategy for England, Scotland, Wales, and Northern Ireland<sup>106</sup> includes long term objectives for improving air quality, focusing on options to tackle pollutants such as particulate matter, nitrogen oxides, ozone, sulfur dioxide, polycyclic aromatic hydrocarbons, benzene, butadiene, carbon monoxide, lead, and ammonia.

All of the eight main pollutant emission levels reported in the National Atmospheric Emissions Inventory decreased between 2005 and 2021, with the greatest rate of decline seen in sulfur dioxide emissions<sup>107</sup>.

---

<sup>100</sup> Landscape Policy Framework. NatureScot, 2023

<sup>101</sup> Scottish Litter Survey. Keep Scotland Beautiful, 2023

<sup>102</sup> The Air Quality Standards (Scotland) Regulations 2010. UK Government, 2010

<sup>103</sup> Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe, EUR-Lex, 2008

<sup>104</sup> Environment Act 1995. UK Government, 1995

<sup>105</sup> The Pollution Prevention and Control (Scotland) Regulations 2012. UK Government, 2012

<sup>106</sup> The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1). DEFRA, 2007

<sup>107</sup> Air Pollutant Inventories for England, Scotland, Wales, and Northern Ireland: 2005-2021, National Atmospheric Emissions Inventory, 2023

The Scottish Waste Environmental Footprint Tool<sup>108</sup> found that, in 2022, discarded equipment (mainly consisting of waste electronic and electrical equipment) was among the top three highest contributors to air pollution of all household waste categories. However, it should be noted that the majority of these impacts are generated during the production stage, and therefore not likely to occur in Scotland. Impacts originating outside Scotland are out of scope of this assessment.

There are concerns over pollutants contributing to worsening air quality as a result of single-use vapes<sup>109</sup>. Vapours from e-cigarettes (vapes) are potent sources of environmental air pollution, particularly aldehydes and carbon monoxide<sup>110</sup>. This assessment considers changes in levels of air pollution expected as a result of the proposed ban on the sale and supply of single-use vapes.

#### 4.10 Water

The European Water Framework Directive<sup>111</sup> sets objectives on the condition of water bodies including rivers, lochs, transitional and coastal waters, and groundwater resources in the EU. Assessments of the chemical and ecological status and consideration of the biodiversity status are required as indicators of water quality. The Water Environment and Water Services (Scotland) Act 2003 and the Water Environment (Controlled Activities) (Scotland) Regulations 2011 set out water environment protection and improvement in the Scottish context and partially implement the Water Framework Directive.

Most of Scotland's seas, coasts, and estuaries are in good or excellent condition, with nearly half of rivers in Scotland in good condition or better and almost two thirds of lochs in good or high condition. Around 80% of Scotland's groundwater is in good condition, although there are regions with widespread problems, for example, in the Central Belt<sup>112</sup>.

This assessment will investigate the contribution the proposed policy could have towards reducing water pollution in bodies of water in Scotland. This would be achieved through reducing occurrences of littered single-use vapes, and the associated risks of residual liquids and plastics reaching waterways.

#### 4.11 Soil

The Scottish Soil Framework<sup>113</sup> was developed with the vision that soils are recognised as a vital part of our economy, environment and heritage, to be safeguarded for existing and future generations. The main aim of the Framework is

---

<sup>108</sup> Scottish Waste Environmental Footprint Tool, Zero Waste Scotland, 2024 (not yet published at time of writing)

<sup>109</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single-use e-cigarettes, Dominic Hogg, 2023

<sup>110</sup> A Review of Environmental Pollution from the Use and Disposal of Cigarettes and Electronic Cigarettes: Contaminants, Sources, and Impacts, Beutel et al., 2021

<sup>111</sup> The European Water Framework Directive

<sup>112</sup> Rivers and Canals: update. Scotland's Environment, 2014

<sup>113</sup> The Scottish Soil Framework. Scottish Government, 2009

to promote the sustainable management and protection of soils consistent with the economic, social, and environmental needs of Scotland.

This assessment will investigate the contribution the proposed policy could have towards reducing soil pollution. This would be achieved through reducing littering of single-use vapes and resultant soil pollution such as microplastics and residual liquids.

## 5 Assessment of likely environmental impacts

### 5.1 Climatic Factors

A 30g single-use vape is estimated to be typically responsible for just over 150g CO<sub>2</sub>e, of which the production of the battery is responsible for 84g CO<sub>2</sub>e. The associated packaging accounts for a further 12g CO<sub>2</sub>e.<sup>114</sup>

It was estimated in that in 2022 the total emissions from single-use vapes in Scotland were between 3,372 and 4,292 tonnes CO<sub>2</sub>e per year, and are projected to rise to between 8,205 and 10,444 tonnes CO<sub>2</sub>e by 2027<sup>114</sup>. These figures include the embodied carbon (i.e. the emissions created extracting materials and producing single-use vapes) and not just territorial emissions (primarily disposal).

Raw material extraction and manufacturing are the most intensive life cycle stages of single-use vapes in terms of greenhouse gas emissions, responsible for 58% and 26% of total life cycle emissions respectively<sup>115</sup>. These impacts are likely to occur outside Scotland and therefore are not technically within scope of this SEA. However, they have been included in this report as the effects of climate change will be felt globally and are occurring as a result of consumption activity in Scotland, even if the activities themselves take place elsewhere. Impacts from use and disposal occur more locally. In the UK, 17% of life cycle emissions from single-use vapes were caused by incineration and waste fires and landfill sites<sup>116</sup>.

In the UK in 2023, the emissions from incineration of single-use vapes were estimated to be 1,681 tonnes CO<sub>2</sub>e. A further 12,970 tonnes CO<sub>2</sub>e are caused by waste fires, caused by crushed lithium-ion batteries when single-use vapes are incorrectly disposed of in landfill<sup>117</sup>. This is projected to increase to over 139,000 tonnes CO<sub>2</sub>e from incineration and over 37,000 tonnes CO<sub>2</sub>e from waste fires by 2030.

Banning the sale and supply of single-use vapes is anticipated to drive a significant shift in consumer behaviour by making vapes less accessible to underage users and less appealing to casual users, whilst encouraging regular users to opt for reusable

---

<sup>114</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single use e-cigarettes. Dominic Hogg, 2023

<sup>115</sup> Analysis of the Market for Vapes: Exploring the environmental impacts of single-use vapes. Eunomia, 2023

<sup>116</sup> Ibid

<sup>117</sup> Ibid

alternatives. It is not anticipated that the proposal will entirely eliminate single-use vapes from the litter stream, given that illegitimate and illegal sales may continue after the implementation of the regulations. However, a significant reduction in the consumption of single-use vapes is highly likely, with an associated drop in the resultant greenhouse gas emissions, both globally from the production of single-use vapes, and in Scotland where they are disposed of.

### **Reasonable alternatives**

Continuing with existing commitments only, and not taking additional measures to reduce consumption of single-use vapes is unlikely to reduce the greenhouse gas emissions caused by single-use vape consumption at scale. Projections of the vape market suggest that it will continue to grow in coming years, with associated emissions from all life-cycle stages of vapes likely to increase in line without intervention<sup>115</sup>.

Launching an information campaign centred around responsible disposal of single-use vapes could help to reduce the greenhouse gas emissions caused by their disposal by increasing collection rates. However, improvements to vapes recycling infrastructure are required before widespread improvements to recycling rates are possible. While improving recycling rates could bring down the contribution single-use vapes make to climate change, in the UK, current recycling only offsets 1.6% of the overall life cycle emissions of single-use vapes<sup>115</sup>. The most effective solution is to reduce the consumption of single-use items in the first instance, in line with the waste hierarchy and the environmental principles discussed in section 3.4.

### **Environmental objectives**

Reduce greenhouse gas (GHG) emissions resulting from the disposal of single-use vapes, including the impacts of the embodied carbon in wasted vapes:

The proposed policy is anticipated to significantly reduce, though not completely eliminate, consumption of single-use vapes in Scotland. This will result in reducing the associated carbon emissions. The most significant impact will be down to a reduction in single-use vapes produced for the Scottish market. However, the largest emissions reductions occurring in Scotland will be those caused by incineration of waste vapes and waste fires from vape batteries in landfill sites.

### **SEA Impact: Significant Positive**

Single-use vape consumption in Scotland is responsible for over 3,000 tonnes CO<sub>2</sub>e each year, and without intervention, this is set to increase to over 8,000 tonnes CO<sub>2</sub>e in the next three years<sup>118</sup>.

---

<sup>118</sup> N.B. These figures include embodied carbon from the raw material extraction and production of single-use vapes.

Banning the sale and supply of single-use vapes will significantly reduce their consumption and subsequent disposal in Scotland, leading to reductions in greenhouse gas emissions from incineration and waste fires.

Further avoided global greenhouse gas emissions are also anticipated outside Scotland, but are beyond the scope of this assessment.

## 5.2 Biodiversity

Littered vapes may cause damage to flora and fauna through the leakage of microplastics, nicotine, and other chemicals into habitats. At this time however, there is limited information available on the exact effects of this pollution on wildlife in Scotland.

E-liquids present in single-use vapes often contain high concentrations of nicotine, which studies suggest can be toxic to microbes, plants, benthic organisms, bivalves, zooplankton, fish, and mammals<sup>119</sup>. E-liquids from flavoured vapes also contain a number of additives, which are suspected in some cases to contain toxic chemicals, such as various aldehydes, tobacco-specific nitrosamines (TSNAs), benzyl alcohol, glycerol-1,2-diacetate, and dioxolane compounds<sup>120</sup>. The electronic components of single-use vapes can also leak metal contamination into the environment, for example aluminium, barium, cadmium, chromium, copper, iron, lead, nickel, silver, tin, and zinc. There is also evidence to suggest that toxic metals can seep into e-liquids<sup>121</sup>, further increasing the risk these items pose to ecosystems when littered and introduced into the environment.

There have been reported incidents of vape consumption by animals causing mild to serious harm and even death. Wildlife and Countryside Link reported both a bird and puppy death after ingesting a vape and vape pod respectively<sup>122, 123</sup>.

Banning the sale and supply of single-use vapes is anticipated to drive a significant shift in consumer behaviour by making vapes less accessible to underage users and less appealing to casual users, whilst encouraging regular users to opt for reusable alternatives. It is not anticipated that the proposal will entirely eliminate single-use vapes from the litter stream, given that illegitimate and illegal sales may continue after the implementation of the regulations. However, a significant reduction in the consumption of single-use vapes is highly likely, with an associated drop in the prevalence of single-use vapes as litter. The extent of the resultant impact on biodiversity in Scotland is unknown, though it is expected that ecosystems will benefit from reduced exposure to nicotine, plastic, and chemical leachates from

---

<sup>119</sup> A Review of Environmental Pollution from the Use and Disposal of Cigarettes and Electronic Cigarettes: Contaminants, Sources, and Impacts, Beutel et al., 2021

<sup>120</sup> Evaluation of e-liquid toxicity using an open-source high-throughput screening assay, Sassano et al., 2018

<sup>121</sup> Metal Concentrations in e-Cigarette Liquid and Aerosol Samples: The Contribution of Metallic Coils, Olmedo et al., 2018

<sup>122</sup> The Environmental case for Banning Disposable Vapes - Wildlife and Countryside Link briefing, Wildlife and Countryside Link, 2023

<sup>123</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single use e-cigarettes, Dominic Hogg, 2023



vapes discarded in the environment. The risk of ingestion by wild animals will also be reduced if the issue of littered vapes is addressed.

However, reusable vapes still pose some of the same threats as single-use alternatives if contaminated packaging items such as refill containers are littered. Littering of e-liquid refill containers poses a serious threat to habitats and species because they can contain high concentrations of residual nicotine. As reusable vapes have a longer lifespan and higher value than their single-use counterparts, littering of the devices themselves is less likely, so the risks of pollution from the plastic casings and metal and electronic components are expected to be lower.

### **Reasonable alternatives**

Continuing with existing commitments only, and not taking additional measures to reduce consumption of single-use vapes is not anticipated to address the issue of littering. Recent trends reported on the frequency of single-use vape littering suggests that the problem could continue to grow without intervention.

Launching an information campaign centred around responsible disposal of single-use vapes could help to reduce the amount littered. Encouraging consumers to return their used vapes for recycling is likely to increase collection rates and therefore reduce the number of vapes littered, however, it is likely that litter reductions seen as a result of an information campaign would be significantly lower than those expected as a result of banning the sale and supply of single-use vapes in the first place.

### **Environmental Objectives:**

Protect habitats and species in Scotland from damage resulting from littered single-use vapes:

The proposed policy will reduce consumption of single-use vapes in Scotland, and it is expected that a reduction in littering of such items will follow soon after. This will protect habitats and species by reducing their exposure to potentially dangerous contaminants including nicotine, plastics, and toxic metals.

### **SEA Impact: Minor positive**

Banning the sale and supply of single-use vapes is expected to significantly reduce consumption and subsequent littering of such items, protecting habitats and species from potentially damaging contamination. Positive impacts may be offset to an extent by increased consumption of reusable vape packaging, such as refill containers, which could also enter the environment as litter. Prevalence of reusable vape components and packaging in the litter stream should be monitored.

### **5.3 Human health**

Banning the sale and supply of single-use vapes will make vaping less accessible for some users, for example, casual users not willing to invest in the initial higher cost of a reusable vape, or underage users who obtain them illegally. The Equality Impact Assessment and Fairer Scotland Assessment consider the impacts on people with certain protected characteristics and lower incomes.

The Tobacco and Vaping Framework<sup>124</sup> recognises that vapes can be one of a range of tools used by adult smokers to quit smoking, though notes that they should never be used by young people or non-smokers. The framework acknowledges recent evidence of the effectiveness of vapes as a cessation tool. Banning the sale and supply of single-use vapes will affect those using such items to quit smoking, posing a potential risk of relapse. The accessibility of reusable vapes ought to minimise the negative human health effects of banning the sale and supply of single-use vapes, since reusable alternatives can be adopted to serve the same purpose as a cessation tool. Nonetheless, some concerns have been raised over the risk of relapse among former smokers relying on single-use vapes to quit<sup>125</sup>. In a recent UK survey of 2,518 current or lapsed vapers, 53% of vapers reported quitting smoking and, 59% of smokers who also vaped reported a decrease in the amount of tobacco they used<sup>126</sup>. It is recommended that targeted support is provided for those using single-use vapes as a tool to quit smoking in order to encourage the use of suitable reusable alternatives.

Consideration was given to the impact of the proposal to overall availability, particularly to those using vapes as a method of smoking cessation. As all current retailers are anticipated to switch products to reusable alternatives, the availability of vapes for smoking cessation purposes should remain the same. Similarly, the availability of reusable vape products from online retailers is anticipated to remain the same as currently.

Individuals wishing to stop smoking will remain able to seek advice and support from existing organisations and support services. This includes Quit Your Way Scotland<sup>127</sup> and NHS services such as local pharmacies. Local specialist 'stop smoking services' commonly help in hospitals, GP surgeries, and local community centres.

There is some evidence to suggest that vaping may act as a gateway to smoking, though more research is needed on this topic<sup>128</sup>. The aforementioned survey<sup>129</sup> found that 26% of single-use vape users started vaping without previous experience of smoking. Research suggests that adults under the age of 25 and those who have never regularly smoked are more likely to use single-use vapes than refillable or pod devices, suggesting that banning the sale and supply of single-use vapes is likely to impact these target groups<sup>130</sup>. Lowering vape use among these groups is likely to bring health benefits through a reduction in exposure to addictive and potentially harmful substances.

---

<sup>124</sup> Tobacco and Vaping Framework, Scottish Government, 2023

<sup>125</sup> Who would be affected by a ban on disposable vapes? A population study in Great Britain, Jackson et al., 2024

<sup>126</sup> Understanding the vaping market, HM Revenue & Customs, 2024

<sup>127</sup> Quit Your Way Scotland, NHS Inform, accessed 18 March 2024

<sup>128</sup> Vaping – Role as a gateway to smoking: evidence briefing, Scottish Government, 2024

<sup>129</sup> Tobacco and Vaping Framework, Scottish Government, 2023

<sup>130</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single use e-cigarettes, Dominic Hogg, 2023

As a relatively new product on the market, the knowledge of long-term impacts on human health of vaping is limited. Current research indicates that there is a significantly lower relative exposure from vaping compared to smoking in biomarkers that are associated with the risk of cancer, respiratory conditions, cardiovascular conditions, and other health concerns<sup>131</sup>. However, both the nicotine content and the presence of other ingredients such as propylene glycol, glycerin, and flavourings have raised concerns due to risk of addiction and a lack of research into the possible negative effects of inhalation<sup>132</sup>. While propylene glycol is considered safe for ingestion, there is some evidence to suggest that, when inhaled it can cause upper respiratory irritation in the immediate term, though long term health effects are not well understood<sup>133</sup>. There have been concerns around the inhalation of propylene glycol in occupational settings, and there been incidences reported of propylene glycerol causing skin allergy<sup>134</sup>. Glycerin also has the potential to cause irritation if it makes contact with eyes<sup>135</sup>. The Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment issued a statement<sup>136</sup> which concluded that there was low concern for the likelihood of adverse health effects in users from short to medium term exposure to both propylene glycol and glycerin. However, the effects of long-term repeated exposures are unknown. Both ingredients were considered unlikely to represent a risk to bystanders.

Though long term impacts remain uncertain, banning the sale and supply of single-use vapes is expected to lower exposure to potentially harmful chemicals among new and non-smokers, in line with the Scottish Government's precautionary approach to vaping products to protect public health.

Vapes containing nicotine are known to cause nicotine addiction, a particular concern regarding new and younger users. The proposed policy is likely to reduce the risk of nicotine addiction by making vaping less appealing to young people and non-smokers. It should be noted that reusable vapes and cigarettes will still be available on the market, and illegal and illegitimate sale of single-use vapes is likely to continue. While the risks of nicotine addiction will be reduced as a result of this policy, they will not be eliminated.

A Canadian study<sup>137</sup> analysing the constituents of vape products found that over one fifth of the products tested contained flavouring chemicals which posed a potential risk of inhalation toxicity (e.g. benzyl alcohol, benzaldehyde, and vanillin). Measurable levels of TSNAs were detected in 70% of tested products. The study

---

<sup>131</sup> Vaping – Health harms: evidence briefing, Scottish Government, 2024

<sup>132</sup> Quit Your Way Scotland, NHS Inform, accessed 18 March 2024

<sup>133</sup> Public Health Consequences of E-Cigarettes. National Library of Medicine, 2018

<sup>134</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single use e-cigarettes. Dominic Hogg, 2023

<sup>135</sup> Tobacco and Vaping Framework, Scottish Government, 2023

<sup>136</sup> [Statement on the potential toxicological risks from electronic nicotine \(and non-nicotine\) delivery systems \(E\(N\)NDS – e-cigarettes\), Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment \(COT\), 2020](#)

<sup>137</sup> Identification of flavouring chemicals and potential toxicants in e-cigarette products in Ontario, Canada, Czoli et al., 2019

concluded that while further research is needed, the vapes tested contained several constituents that may present excess risk to human health including some flavouring chemicals and carcinogenic nitrosamines.

Another health and safety concern resulting from the use of single-use vapes is danger to the public and waste workers from waste fires. The majority of single-use vapes are discarded in the residual waste bin and sent to landfill or incineration. This can result in fires, especially at waste management facilities due to the presence of a lithium-ion battery which can set alight when crushed<sup>138</sup>. Eunomia estimates that 39 fires were caused by single-use vapes in landfill sites in the UK in 2023, and given projected increases in consumption, this could rise to 112 by the year 2030 if no action is taken<sup>139</sup>. This is recommended to be interpreted as a lower bound for the number of waste fires caused by single-use vapes. Fires may also be caused by vapes in waste collection vehicles, waste transfer sites and recycling facilities but limited data is available on these incidents.

Banning the sale and supply of single-use vapes will significantly reduce the number of vapes in the residual waste stream and therefore in landfills, waste collection vehicles, and other waste management facilities. The proposed policy is therefore expected to reduce the human health and safety risk posed by waste fires.

It is also anticipated that secondary benefits to human health will arise as a result of reduced littering and resultant improvements to the quality of outdoor spaces. The level of litter in a neighbourhood has the potential to have a direct and indirect bearing on an individual's mental wellbeing with street litter among the environmental predictors of distress and depression among residents<sup>140</sup>. In addition, mental wellbeing is correlated with the level of satisfaction of residents with the local area, the time spent outside during leisure time, and feelings of safety and security, all of which are likely to be influenced by the presence (or absence) of litter<sup>141</sup>.

There is potential for further indirect health benefits as a result of the reduced risk of pollution to air, water, and soil discussed in sections 5.6 - 5.8.

### **Reasonable alternatives**

Neither current commitments nor an information campaign on responsible disposal are likely to address the human health concerns surrounding use of single-use vapes. Consumption of vapes is projected to increase in coming years in the absence of intervention.

Efforts to increase responsible disposal of single-use vapes (i.e. collection for recycling) could reduce the risk of waste fires, therefore improving human health of any individual harmed in an incident on a collection vehicle or waste management

---

<sup>138</sup> [Statement on the potential toxicological risks from electronic nicotine \(and non-nicotine\) delivery systems \(E\(N\)NDS – e-cigarettes\), Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment \(COT\), 2020](#)

<sup>139</sup> [Lithium-Ion Battery Waste Fires Costing The UK Over £100m A Year](#), Eunomia, 2021

<sup>140</sup> [Supplementary written evidence submitted by Keep Britain Tidy \[LIT 107\], UK Parliament, 2015](#)

<sup>141</sup> Public Health Consequences of E-Cigarettes. National Library of Medicine, 2018

facility. However, the scale of any improvements would be significantly less than removing single-use vapes from the legal market altogether.

Of the options considered in this assessment, the proposed policy is believed to represent the most significant benefits to human health, in particular to young people and new smokers. However, it also represents some potential risks by limiting the range of available cessation tools for those trying to quit. Negative impacts for smokers and former smokers are expected to be minimal due to the ready availability of reusable alternatives.

### **Environmental Objectives**

Improve human health in Scotland through a reduction in the ease of use of single-use vapes for new smokers, and the associated health concerns:

The proposed policy will reduce the consumption of single-use vapes in Scotland. Children, young people, and non-smokers are likely to benefit from reduced risk of nicotine addiction and inhalation of potentially harmful substances. Due to limited research, the long term effects of vaping are not fully understood. Taking a precautionary approach protects the public from potential unknown health risks. The impact of the proposed policy on those using single-use vapes as a cessation tool should be monitored, and targeted support provided to this group.

Reduce the risk to the general public from second hand inhalation of vapours and exposure to chemical pollution and litter caused by vapes:

The proposed ban will reduce exposure of the general public to the chemicals within vapes, though the risks of second-hand vapour inhalation to bystanders is not considered to be significant. Secondary benefits are anticipated through reduced pollution of water and soil from residual e-liquids in littered vapes, as well as mental health benefits due to improved appearance of public spaces and landscapes as a result of reduced littering. These impacts are discussed in sections 5.5 - 5.9.

Reduce the risk of harm to waste managers and members of the public resulting from fires caused by incorrectly disposed vapes:

The proposed policy will reduce the number of single-use vapes in the residual waste stream, thus reducing the risk of fires at landfill sites, in waste vehicles, and in other waste treatment facilities. Waste managers and members of the public will therefore benefit from a lower risk of harm from waste fires.

### **SEA Impact: Positive (with some unknown impacts)**

Human exposure to addictive and potentially harmful substances is expected to be reduced as a result of the proposed policy, though some potential risk was identified among former smokers and those trying to quit smoking. Reusable vapes are expected to significantly mitigate these risks, along with current smoking cessation support and offerings through the NHS.

A reduction in the risk to bystanders of second-hand inhalation will broaden the human health benefits if the ban results in an overall drop in vaping, though such impacts are not understood to be significant.

The health and safety risks of fires caused by lithium-ion batteries in the waste stream will also be reduced, owing to a smaller volume of single-use vapes being disposed of in the residual waste stream.

There will also be indirect secondary health benefits resulting from the wider environmental benefits such as a reduction of chemicals within e-liquids polluting soil and water and mental health benefits from improved landscapes and reduced littering.

Illegal trade of single-use vapes may mean that, while the human health risks described above are reduced, they will not be entirely eliminated.

#### 5.4 Material Assets

As with any single-use item, when a vape is disposed of by incineration, landfill or as litter, the materials used to produce it are wasted.

It is estimated that between 800 and 1,000 tonnes of single-use vapes and their packaging are discarded each year in Scotland<sup>142</sup>. Without intervention, this is expected to increase to between 1,900 and 2,500 tonnes by 2027. An estimated 43.3% - 46.7% of single-use vapes are disposed of in the residual bin, and 3.5% - 10.6% are littered<sup>143</sup>.

A single-use vape usually contains: a plastic or metal casing, a plastic mouthpiece, a synthetic woven filler, a metal coil, a battery (often a lithium-ion polymer battery), a sensor, and sometimes LEDs<sup>144</sup>. The battery makes up approximately 34% of the mass of a typical, and the remaining materials are usually 83% plastic and steel<sup>145</sup>. Single-use vapes are also known to contain small amounts of critical metals such as cobalt and lithium. Packaging is usually made up of cardboard, paper, and metallised polymer film.

The limited lifespan of a single-use vape means that more items are purchased, and therefore larger quantities of these materials are required to fulfil the same function as a reusable vape. A reusable vape can be refilled, recharged, and consequently reused multiple times for a longer period of time than its single-use counterpart, meaning less material is consumed.

#### Reasonable alternatives

---

<sup>142</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single use e-cigarettes, Dominic Hogg, 2023

<sup>143</sup> *ibid*

<sup>144</sup> <sup>144</sup> Identification of flavouring chemicals and potential toxicants in e-cigarette products in Ontario, Canada, Czoli et al., 2019

<sup>145</sup> Analysis of the market for vapes: exploring the environmental impacts of single-use vapes - EV0157, DEFRA, 2024

While existing commitments may improve collection and recycling, they do not address the rapidly increasing consumption of single-use vapes. If recycling infrastructure improves, more materials could be recovered from wasted single-use vapes. However, in line with the waste hierarchy, the maximum impact in terms of preserving material assets will be achieved by reducing the waste arisings in the first instance, and encouraging consumption of reusable vapes.

An information campaign focused on how to responsibly dispose of single-use vapes could also improve collection of vapes for recycling. However, this would need to be combined with improvements to the necessary recycling infrastructure to achieve widespread improvements in recycling. This option also fails to address the root of the issue, as it is not likely to affect consumption of single-use vapes.

### **Environmental objectives**

Reduce consumption of virgin materials, including critical raw materials, used in vapes:

By banning the sale and supply of single-use vapes, consumption of the plastic, steel, batteries, and other materials required to produce them will go down. As vapes are known to contain small amounts of critical raw materials, the proposed policy is expected to lower Scotland's contribution to the depletion of critical resources such as lithium and cobalt.

Reduce loss of materials to landfill, energy recovery, or litter in the form of single-use vapes:

Once single-use vapes are no longer readily available to consumers, it is anticipated that there will be a significant reduction in the volume of such items in the residual waste stream and dropped as litter. A shift towards reusable alternatives is likely, meaning there may be an increase in reusable vape packaging such as refill containers.

### **SEA Impact: Significant positive**

The proposed policy is anticipated to reduce consumption of the materials used to produce single-use vapes, for example, steel, plastic, lithium-ion batteries, and other metals. A shift towards reusable alternatives will reduce the amount of these materials discarded as waste in landfill, by incineration, or dropped as litter.

## **5.5 Landscape and visual impacts**

Single-use vapes are reported to be the fastest growing litter item in Scotland, with 44% respondents to the 2023 Scottish Litter Survey claiming to see them as litter "often", and 50% noticing an increase in this type of litter over the past 12 months<sup>146</sup>. The survey found that sightings of littered vapes were most common in urban and less affluent areas.

---

<sup>146</sup> Scottish Litter Survey. Keep Scotland Beautiful, 2023

There is limited data on the exact number of single-use vapes littered each year, though it was estimated that it equates to around 10% of all vapes consumed; equivalent to between 21 and 79 tonnes in 2022<sup>147</sup>.

Banning the sale and supply of single-use vapes is anticipated to drive a significant shift in consumer behaviour by making vapes less accessible to underage users and less appealing to casual users, whilst encouraging regular users to opt for reusable alternatives. It is not anticipated that the proposal will entirely eliminate single-use vapes from the litter stream, given that illegitimate and illegal sales may continue after the implementation of the regulations. However, a significant reduction in the consumption of single-use vapes is highly likely, with an associated drop in the prevalence of single-use vapes as litter.

It should be noted that a shift in demand for reusable alternatives could result in an increase in consumption of refill containers for refillable vapes. While these containers have not been reported as an issue in the litter stream on the same scale as single-use vapes, it is recommended that prevalence of litter associated with reusable vapes should be monitored and measures taken to ensure a displacement effect does not occur to negate the benefits anticipated from this policy.

### **Reasonable alternatives**

Continuing with existing commitments only, and not taking additional measures to reduce consumption of single-use vapes is not anticipated to address the issue of littering. Recent trends reported on the frequency of single-use vape littering suggests that the problem could continue to grow without intervention.

Launching an information campaign centred around responsible disposal of single-use vapes could help to reduce the amount littered. Encouraging consumers to return their used vapes for recycling is likely to increase collection rates and therefore reduce the number of vapes littered, however, it is likely that litter reductions seen as a result of an information campaign would be significantly lower than those expected as a result of banning the sale and supply of single-use vapes in the first place.

### **Environmental objectives**

Enhance the visual impact of Scotland's landscapes through a reduction in the volume of littered vapes in the environment:

Curbing the fast-growing issue of littered vapes is expected to have a significant positive effect in this topic area, since fewer littered items will detract from landscapes and cause negative visual impacts in outdoor areas across Scotland.

**SEA Impact: Significant positive**

---

<sup>147</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single use e-cigarettes. Dominic Hogg, 2023



A reduction in availability of single-use vapes will result in a reduction in occurrences of vapes as litter, thus avoiding sightings of items in the environment that detract from the Scottish landscape.

## 5.6 Air

Single-use vapes can contribute to air pollution in a number of different ways. Firstly, vapours released during use can pollute the surrounding air on a local scale. Secondly, components of vapes that are incinerated at the end of their lives will contribute to air pollution in the area surrounding the incinerator. Finally, when lithium batteries are disposed of incorrectly and reach landfill sites, they can cause waste fires when compressed. Such fires can cause significant levels of air pollution in the surrounding area as well as greenhouse gas emissions.

When vapes are used, vapours are produced which are potent sources of environmental air pollution, for example, carbon monoxide and aldehydes<sup>148</sup>.

Banning the sale and supply of single-use vapes is anticipated to reduce their use among the Scottish population, thus reducing the associated air pollution.

At the end of their usable lives, the majority of single-use vapes are discarded in the residual waste bin and sent to landfill or incineration. Sales of single-use vapes are projected to increase in the absence of intervention, and so will the associated waste arisings and emissions of both greenhouse gases and airborne pollutants<sup>149</sup>.

Incineration of waste is linked to air and noise pollution on a local scale, though with current stringent emissions standards, the evidence is that the air quality impacts are likely to be small<sup>150</sup>.

If single-use vapes are disposed of as residual waste while still containing their batteries, it can result in fires, especially in landfills, as lithium-ion batteries can set alight when crushed<sup>151</sup>. Eunomia estimates that 39 fires were caused by single-use vapes in landfill sites in the UK in 2023, and given projected increases in consumption, this could rise to 112 by the year 2030 if no action is taken<sup>152</sup>. This is recommended to be interpreted as a lower bound for the number of waste fires caused by single-use vapes, since fires may also be caused in waste collection vehicles, waste transfer sites and recycling facilities but limited data is available on these incidents.

In 2023, fires caused by single-use vapes in landfill sites across the UK were estimated to produce the following levels of air pollutants:

- 10,439 kg nitrogen oxides;
- 13,048kg of sulfur oxides; and

---

<sup>148</sup> A Review of Environmental Pollution from the Use and Disposal of Cigarettes and Electronic Cigarettes: Contaminants, Sources, and Impacts, Beutel et al., 2021

<sup>149</sup> Proposal to ban the sale and supply of disposable vapes (UK-wide assessment), DEFRA, 2024

<sup>150</sup> Stop, Sort, Burn, Bury - incineration in the waste hierarchy: independent review, Colin Church, 2022

<sup>151</sup> <sup>151</sup> Identification of flavouring chemicals and potential toxicants in e-cigarette products in Ontario, Canada, Czoli et al., 2019

<sup>152</sup> [Lithium-Ion Battery Waste Fires Costing The UK Over £100m A Year](#). Eunomia, 2021

- 2,372 kg of particulate matter (PM2.5).<sup>153</sup>

By 2030, it is estimated that these figures could have increased by 187%<sup>154</sup>.

Banning the sale and supply of single-use vapes will significantly reduce the number of these items in the waste stream, thus reducing the risk of fires and the associated release of pollutants.

### **Reasonable alternatives**

Continuing with existing commitments only is not anticipated to address the growing popularity of vaping in Scotland. Air pollution in the form of vapours such as carbon monoxide and aldehydes produced during the use phase of a vape's life cycle are therefore not likely to be reduced without intervention. A communications campaign focused on the end of life destination for single-use vapes will also not affect air pollution during use.

Existing commitments and further communications campaigns seeking to drive up recycling rates for single-use vapes could have a positive impact on air quality. If interventions are successful in diverting vapes from the residual waste stream to be recycled, there will be fewer single-use vapes and, critically, fewer of their batteries, in waste management sites such as landfills. The risk of waste fires would therefore be reduced, protecting air quality in the surrounding areas from the associated pollutants. The scale of the improvement is not likely to be as significant as banning the sale and supply of such items in the first instance, and the opportunity to align with the environmental principles of tackling environmental damage at source with preventative action would be missed.

### **Environmental Objectives**

Contribute to improved air quality through the reduction in use of single-use vapes and resultant pollution from vapours:

A small scale reduction in air pollution is anticipated as a result of a likely reduction in vaping and the associated release of polluting vapours. Locally, this is expected to improve air quality, though impacts are not expected to be significant.

Reduce the risk of air pollution caused by the disposal of waste vapes and the associated risk of waste fires:

The proposed policy is anticipated to reduce consumption of single-use vapes in Scotland, and therefore reduce the number of these items in the residual waste stream. This will result in a decrease in both emissions from energy from waste facilities and a reduction in the likelihood of waste fires caused by the lithium-ion batteries found inside single-use vapes. Improvements to air quality will follow, in particular in areas surrounding waste management sites.

**SEA Impact: Positive**

---

<sup>153</sup> Analysis of the Market for Vapes, Eunomia, 2023

<sup>154</sup> Ibid

The proposed policy is anticipated to result in minor improvements to air quality during the use phase of a single-use vapes' life cycle, and more notable improvements at the end-of-life stage. A reduction in single-use vapes in the residual waste stream will reduce the risk of waste fires occurring at facilities such as landfill sites, thus reducing the release of air pollutants such as particulate matter, nitrogen oxides, and sulfur oxides.

## 5.7 Water

Scotland's consumption of single-use vapes was estimated to use between 18,000m<sup>3</sup> and 24,000m<sup>3</sup> of water in 2022, approximately 900ml water per device<sup>155</sup> during the manufacturing stage. However, as the majority of this water use will occur outside Scotland where the vapes are produced, the water consumption impacts of the proposed policy are considered out of scope for this assessment.

When single-use vapes are littered into the environment their constituent parts can leak chemicals into groundwater and nearby bodies of water.

One of the ingredients in the e-liquid found within single-use vapes is glycerin. Glycerin has some indications of aqua toxicity at high levels of exposure. The European Chemicals Agency (ECHA) Registration Dossier<sup>156</sup> states that efforts should be made to prevent glycerin from entering into soil, ditches, sewers, waterways, and groundwater. The Dossier also states that propylene glycerol, another ingredient in vape e-liquids, should be prevented from entering drains and water courses, as there are some minor indications of aqua toxicity. The nicotine within the residual liquids in littered vapes also poses a risk to the aquatic environment.

The electronic components of single-use vapes can also leak metal contamination into the environment, for example aluminium, barium, cadmium, chromium, copper, iron, lead, nickel, silver, tin, and zinc<sup>157</sup>. There is also evidence to suggest that toxic metals can seep into e-liquids<sup>158</sup>, further increasing the risk these items pose to ecosystems when littered and introduced into the environment.

Banning the sale and supply of single-use vapes is anticipated to drive a significant shift in consumer behaviour by making vapes less accessible to underage users and less appealing to casual users, whilst encouraging regular users to opt for reusable alternatives. It is not anticipated that the proposal will entirely eliminate single-use vapes from the litter stream, given that illegal sales may continue after the implementation of the regulations. However, a significant reduction in the consumption of single-use vapes is highly likely, with an associated drop in the prevalence of single-use vapes as litter. Waterways are likely to benefit from a

---

<sup>155</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single use e-cigarettes, Eunomia, 2023

<sup>156</sup> ECHA Registration Dossier. European Chemicals Agency, accessed 18 March 2024

<sup>157</sup> A Review of Environmental Pollution from the Use and Disposal of Cigarettes and Electronic Cigarettes: Contaminants, Sources, and Impacts, Beutel et al., 2021

<sup>158</sup> Metal Concentrations in e-Cigarette Liquid and Aerosol Samples: The Contribution of Metallic Coils, Olmedo et al., 2018

resultant drop in leachates from vapes discarded in the environment, such as propylene glycerol, glycerin, nicotine, and metals.

However, reusable vapes still pose some of the same threats as single-use alternatives if contaminated packaging items such as refill containers are littered. As reusable vapes have a longer lifespan and higher value than their single-use counterparts, littering of the devices themselves is less likely, so the risks of pollution from the plastic casings and metal and electronic components are expected to be lower.

### **Reasonable alternatives**

Continuing with existing commitments only, and not taking additional measures to reduce consumption of single-use vapes is not anticipated to address the issue of littering. Recent trends reported on the frequency of single-use vape littering suggests that the problem could continue to grow without intervention.

Launching an information campaign centred around responsible disposal of single-use vapes could help to reduce the amount littered. Encouraging consumers to return their used vapes for recycling is likely to increase collection rates and therefore reduce the number of vapes littered, however, it is likely that litter reductions seen as a result of an information campaign would be significantly lower than those expected as a result of banning the sale and supply of single-use vapes in the first place.

### **Environmental objectives**

Protect waterways in Scotland from pollution resulting from littered single-use vapes e.g. from residual nicotine, additives, and microplastics:

The proposed policy will reduce consumption of single-use vapes in Scotland, and it is expected that a reduction in littering of such items will follow soon after. This will protect waterways in Scotland by reducing contamination from residual e-liquids.

### **SEA Impact: Minor positive**

Banning the sale and supply of single-use vapes is expected to significantly reduce consumption and subsequent littering of such items, protecting habitats and species from potentially damaging contamination. Positive impacts may be offset to an extent by increased consumption of reusable vape packaging, such as refill containers, which could also enter the environment as litter. Prevalence of reusable vape components and packaging in the litter stream should be monitored.

## **5.8 Soil**

Littered single-use vapes may pose a risk to soils in Scotland through contamination via residual e-liquids containing chemicals such as glycerin. The ECHA Registration Dossier indicates that efforts should be made to prevent glycerin from entering into

soil and ditches<sup>159</sup>. Impacts are believed to be minimal due to the rapid biodegradability of glycerin in soil.

The electronic components of single-use vapes can also leak metal contamination into the environment, for example aluminium, barium, cadmium, chromium, copper, iron, lead, nickel, silver, tin, and zinc. There is also evidence to suggest that toxic metals can seep into e-liquids<sup>160</sup>, further increasing the risk these items pose to ecosystems when littered and introduced into the environment.

The proposed policy is anticipated to reduce consumption of single-use vapes and associated littering in Scotland. While this reduces the risks posed to soils in the area where vapes are littered, impacts are expected to be minimal. The Scottish Litter Survey<sup>161</sup> found that sightings of littered vapes were most common in urban areas, suggesting that peatlands and soils in rural natural habitats are less likely to be affected.

The impacts may be partially offset by an increase in consumption of reusable vapes, and related packaging components.

### **Reasonable alternatives**

Continuing with existing commitments only, and not taking additional measures to reduce consumption of single-use vapes is not anticipated to address the issue of littering. Recent trends reported on the frequency of single-use vape littering suggests that the problem could continue to grow without intervention.

Launching an information campaign centred around responsible disposal of single-use vapes could help to reduce the amount littered. Encouraging consumers to return their used vapes for recycling is likely to increase collection rates and therefore reduce the number of vapes littered, however, it is likely that litter reductions seen as a result of an information campaign would be significantly lower than those expected as a result of banning the sale and supply of single-use vapes in the first place.

### **Environmental Objectives**

Enhance soil quality in Scotland by reducing soil pollution from littered single-use vapes e.g. from residual nicotine, additives, and microplastics:

The proposed policy will reduce consumption of single-use vapes in Scotland, and it is expected that a reduction in littering of such items will follow soon after. This will protect soils in Scotland from contamination from residual e-liquids, though the impacts are not expected to be significant.

**SEA Impact: Minor positive**

<sup>159</sup> Scoping policy options for Scotland focusing on understanding and managing the environmental impact of single use e-cigarettes, Eunomia, 2023

<sup>160</sup> Metal Concentrations in e-Cigarette Liquid and Aerosol Samples: The Contribution of Metallic Coils, Olmedo et al., 2018

<sup>161</sup> Scottish Litter Survey, Keep Scotland Beautiful, 2023

Banning the sale and supply of single-use vapes is expected to significantly reduce consumption and subsequent littering of such items, protecting habitats and species from potentially damaging contamination. Positive impacts may be offset to an extent by increased consumption of reusable vape packaging, such as refill containers, which could also enter the environment as litter. Prevalence of reusable vape components and packaging in the litter stream should be monitored.

### 5.9 Cumulative impacts

The overall impact of the proposed policy is summarised against each environmental topic below.

| Climatic Factors | Bio-diversity | Water | Human health | Soil | Air | Material Assets | Landscape and visual impacts |
|------------------|---------------|-------|--------------|------|-----|-----------------|------------------------------|
| ++               | +             | +     | +            | +    | +   | ++              | ++                           |

#### Key

|    |                                     |
|----|-------------------------------------|
| ++ | Positive impacts                    |
| +  | Minor or uncertain positive impacts |

There will also be interactions and synergies between the different environmental topics. For example:

- Reducing climate change impacts will benefit biodiversity, as will improved air, soil, and water quality which form part of Scotland’s ecosystems and wildlife habitats.
- Nearby water and soils can benefit from each other’s improved quality, as contaminants may seep between the two.
- Human health will benefit from cleaner air, water, and soils, with a reduced risk of contamination reaching the food chain or drinking water supplies.
- Improvements to the quality of landscapes and biodiversity can bring positive mental health and wellbeing impacts to the population.
- Healthy ecosystems will embolden the positive visual impacts to Scotland’s landscapes, as they will be enhanced by healthy flora and fauna.
- Preservation of material assets reduces the production of greenhouse gases related to virgin material production and manufacturing, thus further reducing contribution to climate change.
- Reduction in the release of air pollutants can also reduce contributions to climate change, and vice versa, lowering emissions of greenhouse gases will improve local air quality.

- As Scotland's soils and peatland are a carbon sink, healthy soils can bring improvements to climatic factors.

No significant conflicts were identified within the environmental topics considered as part of this assessment.

## 6 Maximisation of benefits, mitigation, monitoring, and evaluation

### 6.1 Maximisation of environmental benefits and mitigation of unintended consequences

The following section sets out potential actions which could be considered in order to maximise the benefits identified throughout this assessment, and to mitigate the risk of unintended consequences.

Efforts to improve the collection and recycling infrastructure to allow users to recycle components of reusable vapes and end-of-life reusable vapes should continue. Some of the environmental benefits identified in this assessment are at risk of being undermined if components and packaging of reusable vapes (for example, refill containers and end-of-life reusable vapes) are littered or incorrectly disposed of.

To mitigate the risk of reusable vape litter and disposal undermining the environmental benefits of the proposed ban, vapes should be adequately accounted for within the revised WEEE EPR scheme. The scheme should have a suitable lead-in period with clear instruction and guidance for retailers and members of the public on their new obligations. Monitoring sales volumes and waste arisings will provide the data necessary to keep track of reusable vape use and disposal behaviours following the ban.

Producers of vapes (and other electrical items) should be responsible for the full net cost of disposal (including WEEE in residual waste and littered items) to ensure there are incentives to maximise their collection for recycling. This should be supported by collection and recycling targets for reusable vapes and their components. Clear recyclability criteria should be developed and be easily available to allow for easier extraction of valuable components. Much of this has been included in the recent WEEE EPR consultation and call for evidence.<sup>162</sup>

A post-implementation review of the ban on single-use vapes should be considered to ensure the policy meets the required objectives.

Communications campaigns could support this to ensure users are aware of the correct disposal routes. Producers of reusable vapes should be encouraged to design containers for refills in a way that means they can be more easily reused and recycled.

This assessment has highlighted the need for further research into the long-term human health impacts of vaping. As vaping in Scotland will continue even if single-

---

<sup>162</sup> Call for evidence on reforming the producer responsibility system for waste electrical and electronic equipment, DEFRA, 2023

use vapes are banned, it is important that the health implications are better understood, and the dangers communicated clearly to users.

There is a risk that some individuals using single-use vapes as a smoking cessation tool will return to using traditional cigarettes as a result of the ban, though the availability of reusable vapes does mitigate this risk. Targeted support should be provided for such individuals, and smoking behaviours should continue to be closely monitored by the appropriate public health organisations.

The illegal vape market poses a significant risk of undermining all of the environmental objectives of the proposal. Industry stakeholders estimated that the illegal vape market could be comparable in size to the legal vape market, with one suggesting it could even be double the size<sup>163</sup>. This is particularly pertinent to the proposed ban, as 99% of seized illegal vapes are single-use, and is a particular concern for human health impacts. The professional association for Trading Standards bodies found a third of vapes sold, which includes single-use vapes, have incorrect or absent health warnings, over-capacity tank sizes, a higher than permitted concentration of nicotine, contain Cannabidiol oil (CBD), or are incorrectly labelled. Vape users seeking an alternative to single-use vapes must be encouraged to adopt reusable alternatives from legitimate sellers to prevent the unintended outcome of this policy increasing illegal sales of single-use vapes.

## 6.2 Monitoring and evaluation

It is recommended that a formal monitoring and evaluation plan is drawn up as soon as possible, with the collation of baseline data treated as a priority in advance of the introduction of the proposal.

Clear objectives should be set to confirm what the policy is expected to achieve and the timeframes in which it should aim to do so. These objectives can then form the basis of an evaluation. Consultation responses from the public and other stakeholders should be used to help inform these objectives.

### 6.2.1 Monitoring

It should be agreed at an early stage which organisations will be responsible for gathering monitoring data on the impact of the proposed policy, alongside wider behaviour change relating to smoking and vaping behaviours in Scotland. Organisations such as ASH Scotland should be engaged to make use of existing datasets.

Indicators to be monitored could include, but will not necessarily be limited to:

- Sales of reusable vape devices;
- Sales of reusable vape refills;
- Sales of cigarettes;
- Estimates of illegal sales of single-use vapes including shipments seized;
- Number of adult vape users;
- Data on vape users e.g. age, location, smoker/non-smoker etc;

---

<sup>163</sup> Analysis of the Market for Vapes, Eunomia, 2023



- Number of underage vape users;
- Enforcement data on recorded incidents of breach of regulations;
- Frequency of single-use vapes in ground litter;
- Frequency of refill containers and reusable vape related litter items;
- Public perceptions of vape related litter.

### **6.2.2 Evaluation**

An ex-post evaluation should be conducted to make an overall assessment of the policy and its success in meeting its environmental and wider objectives. The evaluation should comprise the following stages:

#### **1. Scoping**

Prior to commencing the evaluation, a clear theory of exactly what the policy set out to achieve should be agreed. In this instance, the primary objective of the policy is to restrict the consumption of single-use vapes in Scotland. Wider environmental objectives have been suggested within this assessment.

A series of evaluation questions should be agreed upon at this stage.

Potential side effects, unintended consequences, and rebound effects should also be considered.

#### **2. Evaluation Design**

A multi-criteria evaluation of the charge should be designed based on the following criteria:

- Environmental effectiveness: does the ban achieve its environmental objectives?
- Cost-Benefit: Are the overall benefits of the ban worth the costs to various actors?
- Equity: How are the benefits and costs associated with the policy distributed across society?

Intervention theories should be used to develop more granular research questions which scrutinise whether assumptions made throughout the design of the restrictions hold true.

Data collection methods may include interviews with retailers, producers, and wholesalers; surveys of vape users, smokers, and the general public; questionnaires; focus groups; and literature reviews.

Appropriate methods of data analysis should then be determined, with the limitations of each method carefully considered.

#### **3. Conducting the evaluation**

Once the evaluation has been fully scoped out and designed, the data collection can begin in line with the methods selected at step 2. Once the analysis has been completed, a report should be compiled with the key findings, including lessons learned and recommendations. The Scottish Government will be responsible for sharing the findings with relevant stakeholders as deemed appropriate.

## 7 Appendix A: Addressing Responses from Consultative Authorities

All statutory consultees were content with the six week consultation period proposed in the Scoping Report and so this will be retained. Extracts from each of the consultee's feedback on the proposed scope and content of the assessment are set out below alongside the corresponding actions taken, where appropriate.

No changes were suggested to the proposed approach set out in the Scoping Report.

| Consultee                     | Consultation response extract   |
|-------------------------------|---|
| Nature Scot                   | We are content with the scope and level of detail proposed for the assessment. We note the proposed topic-by-topic assessment methodology and we are supportive of this approach. We welcome the stated intention to offer suggestions on maximising environmental benefits, in addition to exploring mitigation options. |
| SEPA                          | We agree with the proposed scope of the assessment and are satisfied with the suggested reasonable alternatives. We are content with the proposed assessment methodology to consider environmental impacts on a topic by topic basis.   |
| Historic Environment Scotland | In light of the information and reasoning set out within the screening and scoping report, we agree with your view that there unlikely to be significant environmental effects for the historic environment.  |

## 8 Appendix B: SEA Compliance Checklist\*

| <b>Environmental Report Requirements</b>  |   |
|---|---|
| <b>Relevant sections of the Environmental Assessment Act</b>  | <b>Section(s) of this report</b>                            |
| 14 (2) The report shall identify, describe and evaluate the likely significant effects on the environment of implementing—  |   |
| (a) the proposals in the plan or programme; and   | 5 Assessment of likely environmental impacts                |
| (b) reasonable alternatives to the plan or programme.   | 3.3 Consideration of reasonable alternatives                |
| 14 (3) The report shall include such of the information specified in schedule 3 as may reasonably be required.  |   |
| Information referred to in schedule 3   |   |
| 1. An outline of the contents and main objectives of the plan or programme, and of its relationship (if any) with other qualifying plans and programmes.  | 2.1 Background and 4 Environmental baseline and related PPS |
| 2. The relevant aspects of the current state of the environment; and the likely evolution thereof without implementation of the plan or programme.  | 4 Environmental baseline and related PPS                    |
| 3. The environmental characteristics of areas likely to be significantly affected.  | 4 Environmental baseline and related PPS                    |
| 4. Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (as last amended by Council Directive 97/62/EC). | 4 Environmental baseline and related PPS                    |
| 5. The environmental protection objectives, established at international, Community or Member State level, which are relevant; and the way those objectives and any environmental considerations have been taken into account during its preparation.   | 4 Environmental baseline and related PPS                    |
| 6. The likely significant effects on the environment, including—<br>a) on issues such as –<br>i) biodiversity and natural heritage;<br>ii) population;<br>iii) human health;<br>iv) fauna;<br>v) flora;   | 5 Assessment of likely environmental impacts                |

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>vi) soil;</li> <li>vii) water;</li> <li>viii) air;</li> <li>ix) climatic factors;</li> <li>x) material assets;</li> <li>xi) cultural heritage and historic environment, including architectural and archaeological heritage;</li> <li>xii) landscape;</li> <li>xiii) the inter-relationship between the issues referred to in heads (i) to (xii).</li> <li>b) short, medium and long-term effects.</li> <li>c) permanent and temporary effects.</li> <li>d) positive and negative effects.</li> <li>e) secondary, cumulative and synergistic effects.</li> </ul> |   |
| <p>7. The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the marine spatial plan or programme.</p>  | <p>6 Maximisation of benefits, mitigation, monitoring, and evaluation</p> |
| <p>8. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of expertise) encountered in compiling the required information.</p>   | <p>3.3 Consideration of reasonable alternatives</p>                       |
| <p>9. A description of the measures envisaged concerning monitoring in accordance with section 19.</p>  | <p>6.2 Monitoring and evaluation</p>                                      |
| <p>10. A non-technical summary</p>  | <p>1 Non-technical summary</p>  |

## 9 Appendix C: Statement to address World Health Organisation Framework Convention on Tobacco Control (FCTC) Article 5.3

All engagement will adhere to our commitments under the World Health Organisation Framework Convention on Tobacco Control (FCTC) Article 5.3. This ensures our tobacco control policies are protected from commercial and other vested interests of the tobacco industry.



© Crown copyright 2024



This publication is licensed under the terms of the Open Government Licence v3.0 except where otherwise stated. To view this licence, visit [nationalarchives.gov.uk/doc/open-government-licence/version/3](https://nationalarchives.gov.uk/doc/open-government-licence/version/3) or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: [psi@nationalarchives.gsi.gov.uk](mailto:psi@nationalarchives.gsi.gov.uk).

Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

This publication is available at [www.gov.scot](http://www.gov.scot)

Any enquiries regarding this publication should be sent to us at

The Scottish Government  
St Andrew's House  
Edinburgh  
EH1 3DG

ISBN: 978-1-83601-142-2 (web only)

Published by The Scottish Government, March 2024

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA  
PPDAS1442346 (03/24)

W W W . g o v . s c o t