**Consultation on the proposed ban of the manufacture, supply and sale of wet wipes containing plastic: Economic annex**

1. This economic annex accompanies the public consultation on the UK-wide proposal to ban the manufacture, supply and sale of wet wipes containing plastic, published on 14 October 2023. This regulation is being proposed due to the negative environmental impacts associated with single use plastic products, incorrect disposal, and the fact that there are already alternatives to plastic-containing wet wipes. The proposed ban could cause some costs to business and government through familiarisation and enforcement costs, as well as plastic wet wipes producers’ loss of profits and a reduction in choice for consumers.

**Rationale for intervention**

1. Plastic-containing wet wipes contribute to plastic pollution in our waters through incorrect disposal by consumers down toilets. Plastic-containing wet wipes produce microplastics when they break down. The term ‘microplastics’ encompasses a wide range of synthetic particles of varying sizes, shapes, and composition and when released into the environment pose potential health risks to humans, wildlife, and the environment.
2. Both of these negative outcomes associated with plastic-containing wet wipes are examples of negative externalities as the user of the wipe does not directly face the costs of their action (pollution).
3. Stakeholder engagement has highlighted that the market is moving towards reducing the manufacture, supply and sale of plastic containing wet wipes and several retailers and producers have already made voluntary commitments to stop producing or selling wet wipes that contain plastic, showing that it is possible and commercially viable. As a result, there are suitable non-plastic wet wipe substitutes currently available, including moist toilet tissue and baby wipes.
4. Whilst the market is partially addressing the problem and businesses have innovated to develop plastic-free wet wipes, there remains some parts of the sector who continue to produce plastic-containing wet wipes, hence the rationale for government intervention.
5. In Defra’s 2021 public Call for Evidence on commonly littered single-use plastic items, 96% of respondents supported a potential ban on wet wipes containing plastic. Defra published a response to the Call for Evidence in January 2023.[[1]](#footnote-2)
6. The Welsh Government also received a large, positive response to the consultation question on future action on wet wipes included in the 2020 consultation, Reducing Single-Use Plastic[[2]](#footnote-3).
7. The UK public consultation proposes banning the manufacture, supply and sale of wet wipes containing plastic. These are actions in a set of actions to reduce single use plastics and ensure that wet wipes are disposed of in a safe way. To tackle plastic waste, the UK and Devolved Governments have already banned microbeads in rinse-off personal care products. Additionally, the UK government, Scottish Government and Welsh government are legislating or have legislated to restrict the supply of single-use plastic products. In Scotland, in June 2022, it became an offence to manufacture and supply single use cutlery, drink stirrers, plates, and polystyrene cups and food containers[[3]](#footnote-4). In England, there is an intention to ban single-use plastic plates, trays, bowls, cutlery, balloon sticks and certain types of polystyrene cups and food containers in England by October 2023[[4]](#footnote-5). In Wales, it will shortly be a criminal offence to supply or offer to supply single-use plastic plates, cutlery, drink stirrers, balloon sticks, drinking straws expanded polystyrene cups and expanded polystyrene takeaway food containers[[5]](#footnote-6).
8. Defra also support the Water UK communications campaign to ‘Bin the Wipe’ and have written to the relevant producers and advertising authorities regarding the labelling of wet wipes as ‘flushable’.

**Market Overview**

1. In a Defra-commissioned report, Valpak have given market insights using their Environment Product Information Centre (EPIC) database and through engagement with key stakeholders such as EDANA UK and Recoup. Table 1 shows the total individual wet wipes sold in the UK[[6]](#footnote-7). Childcare wipes make up over half of all wet wipe sales, with just under 18.5 billion (60%) placed on the market in 2021.

Table 1: Total quantity of wet wipes placed on the market in the UK

|  |  |  |  |
| --- | --- | --- | --- |
| Product Category (millions) | 2019  | 2020  | 2021  |
| Childcare  | 20,462 | 16,813 | 18,477 |
| Cleaning  | 5,232 | 7,154 | 7,190 |
| Cosmetic  | 1,750 | 1,197 | 1,205 |
| Healthcare  | 30 | 89 | 59 |
| Optical Care  | 81 | 66 | 79 |
| Personal Hygiene  | 3,208 | 3,028 | 3,525 |
| Pet Care  | 16 | 12 | 14 |
| TOTAL  | **30,780** | **28,359** | **30,549** |

1. Table 2 shows wet wipe retail unit prices by category. Cosmetic wipes are generally the most expensive whilst childcare and personal hygiene wipes are the cheapest.

Table 2: Unit price of wet wipes[[7]](#footnote-8) (plastic and non-plastic) by category in 2021

|  |  |  |
| --- | --- | --- |
| Product Category | Min Price Per Wipe  | Max Price Per Wipe  |
|  Cosmetic   | £0.10 | £0.16 |
|  Pet Care   | £0.11 | £0.11 |
|  Healthcare   | £0.09 | £0.11 |
|  Cleaning   | £0.08 | £0.10 |
|  Optical Care   | £0.07 | £0.07 |
|  Personal Hygiene   | £0.05 | £0.06 |
|  Childcare   | £0.05 | £0.06 |

**Potential Impacts**

**Summary of impacts discussed in this section**

**Business impacts:**

* Familiarisation costs
* Direct loss of profits
* Small and micro business impact assessment
* Medium business impact assessment
* Material costs
* Enforcement costs

**Consumer impacts:**

* Choice and price impacts

**Societal impacts:**

* Reduction in microplastics in the environment
* Reduction in lifecycle greenhouse gas emissions

**Business impacts**

1. In a Defra-commissioned research project, Valpak estimated that 99% of wet wipes placed on the market in the UK were manufactured domestically in 2019. Following the implementation of any ban, Defra would expect businesses to choose the course of action which maximises their profit function. Though there is potential that for some producers this may mean ceasing production of wet wipes, Defra would also expect some producers to move to production of the next most profitable alternative for their business and switch to producing non-plastic wet wipes.
2. Where producers switch to producing other items, there is likely to be some one-off capital investment cost associated with making this switch. In an extreme scenario, all plastic-containing wet wipe producers could choose to buy entirely new production capital, in order to produce wet wipes using alternative materials. Defra are seeking views on this expectation at consultation.

**Familiarisation costs**

1. Producers, wholesalers, and retailers of the banned items will also face one-off familiarisation costs, from the time taken to read and understand the legislation and subsequently make business decisions relating to the ban. Some of this could involve decisions relating to altering production processes or adjusting business plans and supply chains. Familiarisation costs are likely to be minimised by single-use plastic bans having been in the public domain for a significant amount of time and therefore many businesses would have anticipated this ban, however this does not negate the need to familiarise themselves with the detail. In the 25 Year Environment Plan[[8]](#footnote-9), published in January 2018, the government committed to eradicating avoidable plastic waste by 2042. Then, in November 2021, Defra published a call for evidence on commonly littered and problematic plastic items, where wet wipes were explicitly mentioned as an item of interest[[9]](#footnote-10). This found that 96% of respondents stated that they would support a ban on wet wipes containing plastic. A summary of responses and the government response to this call of evidence was published in January 2023[[10]](#footnote-11).
2. Defra has monetised this cost using the following figures and assumptions:
* Categories of businesses likely to be affected by the ban were identified using Standard Industrialisation Codes[[11]](#footnote-12) (SIC).
* It is difficult to estimate how many businesses within each SIC code currently manufacture, supply or sell wet wipes containing plastic. Therefore, Defra has used a conservative assumption that all businesses within the selected SIC codes will be impacted by this ban and will face familiarisation costs.
* It is estimated that familiarisation would take 30 minutes of one full time employee’s time per enterprise under the central sensitivity. However, Defra has also undertaken sensitivity analysis where the low scenario assumes 15 minutes and the high scenario assumes one hour to account for uncertainty. This was costed at the median average hourly wage for each businesses category[[12]](#footnote-13) plus 22% non-wage labour costs[[13]](#footnote-14) which accounts for national insurance contributions, pension contributions, allowances and benefits on top of basic salary.
1. Under the central scenario, it is estimated that the one-off familiarisation costs are £382,000. The low and the high scenarios estimate the familiarisation cost to be £191,000 and £573,000 respectively[[14]](#footnote-15).

Table 3: UK Familiarisation cost monetisation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SIC code & Industry description | Number of businesses | Median hourly pay (£) | Assumed familiarisation time | Familiarisation cost | non-labour wage adjusted (1.22 multiplier) familiarisation cost |
| 2229: Manufacture of other plastic products  | 2,425 | £13.12 | 30 minutes | £15,908 | £19,408 |
| 4649: Wholesale of other household goods  | 5,000 | £13.52 | 30 minutes | £33,800 | £41,236 |
| 4673: Wholesale of wood, construction materials and sanitary equipment  | 5,345 | £12.63 | 30 minutes | £33,754 | £41,179 |
| 4711: Retail sale in non-specialised stores with food, beverages or tobacco predominating  | 32,715 | £10.77 | 30 minutes | £176,170 | £214,928 |
| 4719: Other retail sale in non-specialised stores  | 7,935 | £10.50 | 30 minutes | £41,659 | £50,824 |
| 4775: Retail sale of medical and orthopaedic goods in specialised stores  | 1,775 | £13.61 | 30 minutes | £12,079 | £14,736 |
|  |  |  |  |  | £382,311 |

**Estimating total revenue for the UK’s wet wipe retail market**

1. The UK retail revenue of wet wipes produced domestically can be estimated using the total individual wet wipes placed on the market that were produced domestically multiplied by the unit price.
2. Defra has calculated the number of wet wipes placed on the market that were produced domestically in the UK by adjusting Valpak’s total wet wipes placed on the market figure by Valpak’s estimates for the UK’s net trade of wet wipes.
3. The total units placed on the market by category is multiplied by the price by category to estimate UK wet wipes retail revenue (table 4). The low and the high scenario are calculated using the minimum and maximum price by wipe respectively. The central estimate is the midpoint of the low and high estimate. Childcare wet wipes make up over half of the revenue market share with an estimated £1,011m in 2021.

Table 4: Estimated UK retail revenue of wet wipes produced domestically

|  |  |  |
| --- | --- | --- |
| UK Retail revenue (£m) | 2020  | 2021  |
| Product Category  | **Low** | **Central** | **High** | **Low** | **Central** | **High** |
|  Cleaning   | 573 | 645 | 717 | 572 | 644 | 715 |
|  Cosmetic   | 120 | 156 | 192 | 120 | 156 | 192 |
|  Healthcare   | 8 | 9 | 10 | 5 | 6 | 6 |
|  Personal Hygiene   | 152 | 167 | 182 | 175 | 193 | 210 |
|  Pet Care   | 1 | 1 | 1 | 2 | 2 | 2 |
|  Optical Care   | 5 | 5 | 5 | 5 | 5 | 5 |
|  Childcare   | 842 | 926 | 1,011 | 919 | 1,011 | 1,103 |
| TOTAL  | **1,701** | **1,909** | **2,117** | **1,798** | **2,016** | **2,233** |

**Estimating profit loss for producers**

1. A ban would have a direct impact on businesses producing plastic wet wipes leading to a loss of profits. This is considered a direct impact to business as it is an immediate and unavoidable (‘first round’) impact resulting from the ban[[15]](#footnote-16). This impact will therefore be considered within Defra’s equivalent annual net direct cost to business (EANDCB) calculation.
2. There is potential that some producers may cease production, however it is expected that some producers to move to the next most profitable alternative. It is acknowledged that any switch in production is likely to result in lower total profit, otherwise producers would have already made this switch. But it is reasonable to expect a proportion of the lost profit to be recouped through production of other items. This would be an indirect impact and will not be considered within Defra’s EANDCB calculation.
3. To monetise this, Defra takes the estimate for annual retail revenue for all wet wipes that were manufactured in the UK and works backwards through the supply chain, removing the assumed profit margin at each stage of retail, wholesale, and production. The central estimate for annual retail revenue for all wet wipes that were manufactured in the UK is shown in table 3 above as £2,016m. This estimate is then multiplied by the estimated retail markup. The retail markup is calculated using 2020 Annual Business Survey (ABS) Data[[16]](#footnote-17) for Standard Industrial Classification (SIC) code 47 “Retail trade, except of motor vehicles and motorcycles”. Turnover net of purchases of goods, materials and services is calculated as a proportion of turnover, giving an estimated retail markup of 18.1%. Defra then multiplies retail revenue by the retail markup to estimate a wholesale revenue of £1,650m.
4. A similar step is taken again to estimate the producer revenue, by accounting for the wholesale markup. The wholesale markup is calculated using 2020 ABS data for SIC code 46 “Wholesale trade, except motor vehicles and motorcycles”. Again, using turnover net of purchases of goods, materials and services is calculated as a proportion of turnover, this results in an estimate wholesale markup of 15.8% which can be multiplied by the estimate wholesale revenue to estimate a producer revenue of £1,389m.
5. Annual Business Survey Data for SIC code 22 ‘manufacture of rubber and plastic products’ is used to calculate an estimate of producer profit margins. Turnover net of purchases of goods, materials and services and net of employment costs is calculated as a proportion of turnover, giving a producer profit margin of 16.2%. Multiplying producer revenue by the producer profit margin gives an annual producer profit estimate of £225m.
6. This methodology assumes that all wet wipe supply chains contain wholesalers. Defra’s stakeholder engagement has indicated that larger retailers may source their wet wipes directly from producers[[17]](#footnote-18). This would lead to a higher estimated producer profit as the wholesale markup is bypassed. Under an extreme scenario where all retailers source wet wipes directly from producers, producer profit is estimated to be £268m.
7. These figures are for all wet wipes sold in the UK. This is then multiplied by the profit estimates by the proportion of wet wipes sold in the UK made of plastic to estimate the profit from plastic wet wipes production.

**Small and Micro Business Assessment (SaMBA)**

1. Defra will be conducting a UK-wide small and micro business assessment in the final impact assessment. To estimate the market share held by businesses of different sizes Defra uses the turnover data[[18]](#footnote-19) by SIC codes published by the Office for National Statistics (ONS). The proportion of turnover by “G: wholesale and retail trade; repair of motor” can be used as a proxy for the market share split of wet wipe retailers/wholesalers and “C: Manufacturing” turnover split can be used as a proxy for the market share split of wet wipe manufacturers. This market split is displayed in table 5.

Table 5: Turnover market share of affected businesses by employment size band for the UK

|  |  |
| --- | --- |
| UK Market share by turnover | Employment size band   |
|    | **Micro**  | **Small**  | **Medium**  | **Large**  |
| **(0–9 employees)**  | **(10–49 employees)**  | **(50–249 employees)**  | **(250 or more employees)**  |
| G : Wholesale and retail trade; repair of motor  | 12% | 17% | 20% | 50% |
| C : Manufacturing  | 5% | 9% | 18% | 68% |

1. (Note that some of the large manufacturing turnover was not included in the ONS dataset to avoid disclosure by deduction. Therefore, the percentages above likely underestimate the market share of the large manufacturers)
2. These market share split estimates can be applied to business impact estimates to assess the impact that the ban will have on small and micro businesses.

**Medium business assessment**

1. Table 5 shows the turnover market share of ONS’ definition of medium businesses (50-249 employees), which is 20% of market share in wholesale and retail sectors and 18% in manufacturing.
2. The Better Regulation Framework guidance classifies medium businesses as businesses within the employment band of 50-499 employees. As ONS data is unable to provide an estimate for the number of businesses with an employment size band between 50-499, Defra have used Nomis data to provide an approximate estimate. Table 6 shows the number of businesses in the UK within the SIC codes that Defra have identified as being affected by the ban, obtained through Nomis data[[19]](#footnote-20). 950 businesses are within the employment band and SIC codes that have been identified as potentially impacted by the proposed ban. Data on the turnover split of businesses within this employment size band is not available.

Table 6: Number of businesses in the UK within SIC codes affected by the ban within the 50-499 employment size band

|  |  |
| --- | --- |
| Number of businesses in UK by employment band and sector (SIC 4) | Medium (50-499 employees) |
| 2229 : Manufacture of other plastic products | 205 |
| 4649 : Wholesale of other household goods | 170 |
| 4673 : Wholesale of wood, construction materials and sanitary equipment | 285 |
| 4711 : Retail sale in non-specialised stores with food, beverages or tobacco predominating | 180 |
| 4719 : Other retail sale in non-specialised stores | 85 |
| 4775 : Retail sale of cosmetic and toilet articles in specialised stores | 25 |
| Total | **950** |

**Material costs**

1. Defra-commissioned market research suggests that the material wet wipes were made from was not a significant impact in the retail price of wet wipes. The intended use of the wet wipes was a much more significant factor on the price e.g. cosmetic wet wipes were more expensive than childcare wet wipes. Therefore, Defra assumes that a ban on plastic wet wipes will not lead to a higher material cost impact. Defra are seeking views on this assumption at consultation.

**Enforcement cost**

1. The regulation will be enforced by the Trading Standard Authorities (TSAs) offices across the UK. It is assumed that the policy will be enforced using a reactive method so compliant businesses will not face any enforcement related costs.
2. Monetisation of the additional burden to TSAs will be done by calculating the time related cost of inspecting premises and non-chargeable advice provided to business.

**Consumer Impacts**

1. Consumers may be impacted initially by a reduction in product choices as plastic wet wipes are removed from the market. This impact is expected to reduce over time as some producers switch to producing wet wipes that do not contain plastic. As stated above, evidence from our commissioned project suggests that there is not a significant price difference between wet wipes that contain plastic and those that do not. Therefore, Defra does not expect there to be any direct price impacts on consumers. Furthermore, stakeholder engagement has indicated that retailers have not received negative feedback from customers regarding alternative products to wet wipes that contain plastic.

**Benefits to society**

**Reduction in microplastics in the environment**

1. Wet wipes are a source of smaller and micro sized plastic fibres/particles that are released as the wet wipes break down both in water and on land[[20]](#footnote-21). A ban on the manufacture, supply and sale of wet wipes that contain plastic would reduce the amount of microplastics released into the environment.

**Life-cycle greenhouse gas emissions**

1. The materials in non-plastic wet wipes are less emission intensive in the production process. This covers all emissions from the point of raw material extraction through to the point at which a finished good is manufactured. Defra assumes that plastic wet wipes are made of 70% polyethylene terephthalate (PET) and 30% viscose, whereas non-plastic wet wipes are made of only viscose[[21]](#footnote-22). Viscose emits 1.46 tonnes of carbon dioxide equivalent (tCO2e) per tonne of viscose produced[[22]](#footnote-23), whereas PET emits 4.02 tCO2e per tonne of PET produced[[23]](#footnote-24). Valpak have reported that 97.5% of wet wipes placed on the market in the UK are produced domestically[[24]](#footnote-25). Therefore, when the production of wet wipes containing plastic is banned, the total production emissions of wet wipes in the UK will reduce.
2. When materials are disposed of via incineration, they emit greenhouse gases. However, the vast majority of incineration recovers energy by using the heat generation to run steam turbines (called ‘Energy from Waste’). Therefore, some of the greenhouse gases emitted is offset by the power generated, reducing the amount of fossil fuel derived power needed to be supplied to the national grid. Plastic wet wipes are estimated to have a higher net incineration disposal emission cost than non-plastic wet wipes. Therefore, this ban would result in a reduction in incineration emissions.
3. Biodegradable alternatives to plastic wet wipes can result in higher greenhouse gas emissions as they degrade in landfills compared to wipes containing plastic. Biodegradable materials release methane as they degrade which is a greenhouse gas with a global warming potential (GWP) that is 28 times higher than carbon dioxide[[25]](#footnote-26). The associated increase in carbon emissions in the policy scenario compared to the counterfactual scenario are reflected in the landfill disposal emissions cost.
4. Preliminary modelling has indicated that the life-cycle emissions of the non-plastic wet wipe alternatives are lower than that of wet wipes containing plastic. Therefore, if a ban were introduced it would result in a life-cycle emissions saving.

**Monitoring and Evaluation**

1. Existing data sources will be used to monitor the number of plastic wet wipes on sale in the UK following the implementation date, excluding those for exempted purposes. The number of plastic wipes on sale is the key objective of this policy and will be used as a proxy to assess the broader outcomes; namely the reduction in microplastics being released into the environment and the reduction in emissions from the production and disposal of wet wipes. These broader outcomes will not be assessed directly due to a lack of existing evidence to provide a suitable baseline. As much as possible, Defra will utilise existing data sources to monitor these outputs and outcomes. However, if there are insufficient data by the time of the Post Implementation Review, Defra will consider commissioning suitable research to address this evidence gap.
2. The main external factors that will influence the success of the policy are the factors which would have led businesses to transition to non-plastic alternatives to wet wipes without this policy intervention. These factors include the cost of non-plastic alternative material, the interest of consumers in having non-plastic alternatives and the purchasing of wet wipes against alternative products. At present, many businesses are moving mostly or entirely to non-plastic wet wipes and the assumption within this evaluation is that businesses would have transitioned many of their products eventually without this policy intervention. If external factors change the landscape such that that transition was not inevitable, then that assumption will have to be re-examined.
3. The success of the policy is dependent on compliance from all parts of the supply chain, excluding those exempted. The assumption within the policy is that limited enforcement is required to achieve a high level or total compliance. External factors could discourage businesses from complying thus increasing the need for greater enforcement, likely at a higher cost.
4. Defra will monitor the implementation of this policy through engagement with key stakeholder groups such as trade associations and the NHS. Early indications of unintended consequences would include greater than expected impacts to businesses of implementation, lack of availability of non-plastic wet wipes for consumers and a disruption in supply for exempted purposes.
5. The effect of this policy will be reviewed in line with the standard 5-year post implementation review process.
1. Summary of responses and government response - GOV.UK (www.gov.uk) [↑](#footnote-ref-2)
2. <https://www.gov.wales/reducing-single-use-plastic-wales> [↑](#footnote-ref-3)
3. [The Environmental Protection (Single-use Plastic Products) (Scotland) Regulations 2021 (legislation.gov.uk)](https://www.legislation.gov.uk/ssi/2021/410/contents/made) [↑](#footnote-ref-4)
4. [Far-reaching ban on single-use plastics in England - GOV.UK (www.gov.uk)](https://www.gov.uk/government/news/far-reaching-ban-on-single-use-plastics-in-england) [↑](#footnote-ref-5)
5. [The Environmental Protection (Single-use Plastic Products) (Wales) Act | GOV.WALES](https://www.gov.wales/environmental-protection-single-use-plastic-products-wales-act) [↑](#footnote-ref-6)
6. Defra commissioned report by Valpak [↑](#footnote-ref-7)
7. These include the costs of top selling wet wipe products from each category across five major supermarkets and high street retailers. This is sourced from Valpak. [↑](#footnote-ref-8)
8. <https://www.gov.uk/government/publications/25-year-environment-plan> [↑](#footnote-ref-9)
9. <https://consult.defra.gov.uk/environmental-quality/call-for-evidence-on-commonly-littered-and-problem/> [↑](#footnote-ref-10)
10. <https://www.gov.uk/government/consultations/single-use-plastic-banning-the-supply-of-commonly-littered-single-use-plastic-items/outcome/summary-of-responses-and-government-response>) [↑](#footnote-ref-11)
11. Office for National Statistics UK business: activity, size and location table 4: <https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/datasets/ukbusinessactivitysizeandlocation> [↑](#footnote-ref-12)
12. [Office for National Statistics ‘Earnings and hours worked’, gross hourly pay 2022](https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry4digitsic2007ashetable16) [↑](#footnote-ref-13)
13. [RPC\_short\_guidance\_note\_-\_Implementation\_costs\_\_August\_2019.pdf (publishing.service.gov.uk)](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/827926/RPC_short_guidance_note_-_Implementation_costs__August_2019.pdf) [↑](#footnote-ref-14)
14. Estimates are given to the nearest £1,000 [↑](#footnote-ref-15)
15. As set out in RPC guidance: [RPC\_case\_histories\_-\_direct\_and\_indirect\_impacts\_\_March\_2019\_\_1\_.pdf (publishing.service.gov.uk)](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/790016/RPC_case_histories_-_direct_and_indirect_impacts__March_2019__1_.pdf) [↑](#footnote-ref-16)
16. [Non-financial business economy, UK regional results: Sections A to S - Office for National Statistics](https://www.ons.gov.uk/businessindustryandtrade/business/businessservices/datasets/uknonfinancialbusinesseconomyannualbusinesssurveyregionalresultssectionsas/current) [↑](#footnote-ref-17)
17. Defra are seeking to gather further evidence on this at consultation [↑](#footnote-ref-18)
18. [Enterprises by employment and turnover size - Office for National Statistics (ons.gov.uk)](https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/adhocs/1460enterprisesbyemploymentandturnoversize) [↑](#footnote-ref-19)
19. Nomis, UK business counts – entered by industry and employment size band and filtered for 2022. [↑](#footnote-ref-20)
20. #  Lee et al (2021) [Discharge of microplastics fibres from wet wipes in aquatic and solid environments under different release conditions](https://www.sciencedirect.com/science/article/abs/pii/S0048969721022142)

 [↑](#footnote-ref-21)
21. 70% PET and 30% Viscose used as representative composition of wet wipes containing plastic in Zhang et al 2021 life cycle environmental impact assessment. Wet wipes containing plastics can be made up of a variety of compositions but this is taken as representative in the study. [↑](#footnote-ref-22)
22. Zhang, Y., Wen, Z., Lin, W., Hu, Y., Kosajan, V. and Zhang, T., 2021. Life-cycle environmental impact assessment and plastic pollution prevention measures of wet wipes. *Resources, Conservation and Recycling*, *174*, p.105803. [↑](#footnote-ref-23)
23. Government GHG conversion factors <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023> [↑](#footnote-ref-24)
24. Defra assumes this UK domestic production proportion holds for England [↑](#footnote-ref-25)
25. <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1161317/2023-ghg-cf-methodology-paper.pdf> [↑](#footnote-ref-26)