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## Letter submitted by Defra

### Plastic bag charge carbon emissions analysis

The Committee has asked if we could provide further information about the carbon emissions analysis which we provided in our written evidence.

The Government has not been using a carbon reduction argument as the main basis for the policy to reduce the distribution of single-use plastic carrier bags and increase the number of bags being reused by consumers. The main benefits of this policy are in terms of a reduction in litter on land and at sea. In addition this will also reduce the environmental, resource and economic cost of their production, storage and transport. Until this point in the process, therefore, we had not carried out a thorough review of the relevant carbon data. When we did so an error came to light in an estimate of the benefits carried out in 2012; this over-estimated the carbon impact significantly due to how the original 2006 Environment Agency figures were being used.

The analysis set out below therefore differs from that in our original evidence and we would like to take this opportunity to rectify the error.

The 2006 Environment Agency's assessment of the life cycle environmental impacts of different carrier bags presents CO<sub>2</sub>e figures for each type of bag (single-use plastic bag, paper bag, bag for life, etc) based on a comparable 'functional unit', i.e. carrying one month's shopping (483 items) home. For example 82 single-use bags are required to fulfil this function, with associated emissions of 1.57 kg CO<sub>2</sub>e, while 61 bags for life fulfil the same function with emissions of 1.39 kg CO<sub>2</sub>e (if each bag for life is re-used 5 times). The error was to use the CO<sub>2</sub>e figures associated with one month's shopping as referring to individual bags (i.e. one single-use plastic bag was assigned emissions of 1.57kg CO<sub>2</sub>e), thus overstating the carbon impact of the charge by a factor of 82.

The estimates are calculated on an embedded emissions approach. This means that much of the emissions reduction occur outside of the UK as most plastic bags are manufactured abroad.

I have attached a revised copy of the Defra written evidence and have set out the areas requiring amendment below. If possible we would also like to correct one of the statements given by the Minister, Dan Rogerson, during his oral evidence.

### Amendments (in bold):

#### EAC written evidence

"Paragraph 19. The charge in England is also expected to reduce the local environmental and biodiversity impact of littered bags. The indicative reduction in single-use plastic bag usage outlined would cause an associated fall in GHG emissions of around **97,000-130,000** tonnes CO<sub>2</sub> equivalent (not taking into account impacts of plastic bags for life or bin liners)."

"Footnote 15. EA 2006 estimates 1.57 kg co2e **per month's shopping** <http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/scho0711buan-e-e.pdf>"

"Paragraph 26. The Government has calculated that even if customers of large retailers increase their paper bag use by 50% there would still be a negligible environmental impact in terms of carbon emissions (**3,500** tonnes CO<sub>2</sub> equivalent **representing less than 4% of the savings from plastic bags**) due to the very low current levels of use."

#### EAC oral evidence

"We would expect also that we could reduce greenhouse gas emissions by around **97,000 -130,000** tonnes of CO<sub>2</sub>, which is equivalent to permanently taking **32,000 – 43,000** cars off the road."

I trust this information on our carbon emissions analysis is sufficient and answers any queries the Committee might have had.

29 January 2014

**Department of Environment, Food and Rural Affairs Written Evidence into the Inquiry by the Environmental Audit Committee on plastic bags (Revised)**

**Summary**

1. The Deputy Prime Minister announced in autumn 2013 that the Government would bring into force a 5p charge on all single-use plastic carrier bags in England in October 2015. Experience from the Welsh and Northern Irish carrier bag charges suggests that this will significantly reduce the number of plastic bags distributed in this country and increase their re-use. Wales saw a 76% decrease in single-use carrier bag distribution in the year following the charge[1]. This should lead to an associated reduction in plastic bag littering in the local environment and marine where they do significant damage.
2. Our main aim remains to reduce the distribution of plastic bags, and tackle waste and littering, with reuse and eventual recycling being important secondary aims. This is in line with the aims of the Waste Prevention Programme for England[2] which was published on 11 December 2013.
3. On 25 November we launched our Call for Evidence on key aspects of how a plastic bag charge in England will work. The Call ends on 20 December[3] and covers items similar to the questions posed by the Environmental Audit Committee.
4. We are encouraging the development of biodegradable bags with reduced environmental impact compared to traditional plastic bags, to provide consumers with options for those times when they do need a bag, with an exemption from the requirement to charge for biodegradable bags that meet certain standards. Standards are yet to be developed and we are looking to industry to innovate in this area over the medium term.
5. Due to the concern raised by waste recyclers about the impact of biodegradable bags on the quality of recyclate, we are currently reviewing the evidence available and expect to receive more through our Call for Evidence. Our recent Small Business Research Initiative also considered innovative solutions to detect and separate out plastics when mixed in the waste stream and we are currently reviewing the bids received.

**Introduction**

6. Discarded plastic bags are a very visible form of littering and can cause injury to marine wildlife and harm the marine environment. The environmental impact of plastic bags extends beyond their littering. They consume resources, including oil, in their creation. Even when disposed of responsibly, plastic bags can last for long periods of time in landfill sites.
7. In 2012, supermarkets gave out over 8 billion single-use carrier bags across the UK, the vast majority of which were plastic. That is over 120 bags per person. This equates to about 60,000 tonnes of single-use carrier bags[4] in total over the year. Distribution in the UK has been rising year on year[5].
8. In October 2015, the Government will bring into force a 5p charge on all single-use plastic carrier bags in England. There is already a similar 5p charge on single-use bags in Wales and Northern Ireland, and Scotland will be introducing a charge in 2014. Experience from the Welsh and Northern Irish carrier bag charges suggests that this will considerably reduce the number of plastic bags distributed in this country and increase their re-use. Wales saw a 76% decrease in single-use carrier bag distribution in the year following the charge[6].
9. Our main aim remains to change public behaviour and so reduce the distribution of plastic bags and tackle waste and littering with reuse and eventual recycling being important secondary aims. This is in line with the aims of the Waste Prevention Programme for England[7] which was published on 11 December 2013.
10. The charge in England will not include:
  - biodegradable plastic bags that meet defined criteria. This is part of our challenge to UK industry to find innovative approaches to decrease the environmental impact of plastic bags.
  - re-usable 'Bags for Life' as we want people to buy and reuse these bags, which when reused enough times have a lower environmental impact than single use carrier bags.
  - paper bags as we are focussed on tackling the use of plastic single use carrier bags to reduce litter and damage to the marine environment.

11. Nor will the charge apply to organisations with fewer than 250 employees. This means that local grocers, independent corner shops and non-chain takeaways will not need to charge for plastic bags, though of course they may participate if they choose.
12. The charge in England will be as consistent as practical, in line with its key aims, with the charging schemes in the other countries of the UK, in order to maintain a coherent regulatory environment for organisations.
13. The Government will not collect the proceeds of this charge in England, which will stay with the organisations collecting them. We will encourage these organisations to donate the profits to good causes.
14. On 25 November we launched our Call for Evidence on key aspects on how a plastic bag charge in England will work. The Call runs for 4 weeks and ends on 20 December<sup>[8]</sup> and asks for further evidence on items similar to the questions posed by the EAC.

**The environmental impacts of the proposed 5p charge in England, including:**

- **The likely change in the number of bags discarded and any benefits for biodiversity and the environment;**

15. In 2012, supermarket customers in England used 7.06 billion single use plastic carrier bags<sup>[9]</sup>. If in line with the experience elsewhere this figure falls by between 60 and 80% after the introduction of a 5p charge, 4.2 to 5.6 billion fewer single use plastic carrier bags could be used and discarded in England per annum. This would have benefits not only in terms of litter, and marine environment, but waste disposal costs (financial and environmental) and resource efficiency.
16. There would also be a reduction in plastic bags used by customers at large high street retailers, which will also be required to introduce the charge. The current number of bags used in this sector is not certain but is estimated to be in the order of 1.5 billion. Experience in Wales<sup>[10]</sup> shows that reduction on the high street is slightly lower than in supermarkets so if a 50-70% rate of reduction occurs a further 0.75-1 billion bags would not be distributed.
17. The 2012/13 Keep Britain Tidy Local Environmental Quality Survey of England found that 3.5% of sites surveyed were affected by supermarket plastic bag litter. Some types of land are worse affected, with 7% of rural roads surveyed affected by supermarket bags. Plastic bags also make up a share of marine and coastal litter<sup>[11]</sup>. Plastic, mainly plastic bags and bottles, accounted for more than 70% of the total number of marine debris in European seas<sup>[12]</sup>. Surveys consistently find around 40 plastic bags per kilometre of beach in the UK, or one bag every 25 metres<sup>[13]</sup>. Plastic bag litter could affect tourism (coastal tourism contributes around £7.5 billion to the UK economy each year) and also the fishing industry (for example marine litter costs the Scottish fishing industry around £10m per year). In 2010 UK municipalities spent approximately £15 million each year removing beach litter, representing a 37% increase in cost over the previous 10 years.<sup>[14]</sup>
18. Microplastics in the marine environment come from a range of sources, including the breakdown of larger items such as plastic bags. Marine microplastics have been shown to absorb pollutants from the marine environment and are sometimes ingested by marine organisms. This is a cause for concern although at the moment we are not able to assess this harm. Defra has commissioned research on possible harm caused by microplastics in the marine environment by Plymouth and Exeter Universities which will report in March 2014.
19. The charge in England is also expected to reduce the local environmental and biodiversity impact of littered bags. The indicative reduction in single-use plastic bag usage outlined would cause an associated fall in GHG emissions of around 97,000-130,000 tonnes CO<sub>2</sub> equivalent (not taking into account impacts of plastic bags for life or bin liners).<sup>[15]</sup>

- **The likely change in the volume of plastic film produced, and the impact of a reduced demand for the oil production by-product used to make bags;**

20. Using weight as an easily comparable measurement of volume, the weight of single-use plastic bags used by supermarket customers in England in 2012 was 52,600 tonnes. If single-use plastic bag usage decreased by 80%, as seen in Wales, the total would be around 10,500 saving 42,100 tonnes of material. If the reduction was 60%, the total weight would be 21,000 tonnes saving 31,600 tonnes of material.
21. If it is assumed that 1 tonne of polyethylene requires 2 tonnes of oil to produce (including raw material and energy), demand for oil could be reduced by 63,200-84,200 tonnes. However, this does not take into account the expected increase in the usage of bags for life and bin liners. See paragraphs 23-25 for further information.

- **the impact on the use of biodegradable bags and the impact on plastics recycling;**

22. We are encouraging the development of better biodegradable bags to provide consumers with options for those times when they do need a bag, with an exemption from the requirement to charge for biodegradable bags that meet

certain standards. Standards are yet to be developed and we are looking to industry to innovate in this area.

23. Due to the concern raised by waste recyclers about the impact of biodegradable bags on the quality of recycle, we are currently reviewing the evidence available and expect to receive more through our Call for Evidence. Our recent Small Business Research Initiative also considered innovative solutions to detect and separate out plastics when mixed in the waste stream and we are currently reviewing the bids received.

- **Other environmental impacts**

- Increase in sales of other plastic bags

24. A charge on single use carrier bags can lead to increased sales of other types of bags i.e. plastic bags for life, bin liners, nappy bags etc. Plastic bags for life are heavier than single use plastic bags and should be re-used at least 4 times to ensure they have a lower environmental impact than single-use plastic bags.

25. However, in Wales between 2010 and 2012 the number of plastic 'bags for life' brought increased by 120-130%. For five retailers who supplied Welsh-specific data on bags for life and single-use plastic bags, the increase in material used for bags for life (463 tonnes) was 28% of the reduction in material used for single-use bags (1,654 tonnes). Sales of swing bin liners and pedal bin liners in Wales were estimated to be 11 million higher than if the charge had not been introduced. Sales of nappy bags and larger refuse bags showed no change in sales. The increase in bin-bag sales was around 4.8% by weight of the fall in single use plastic bag usage. Overall the increase in material from bin bags and bags for life was 32.8% of the fall in material from fewer single-use bags (or 25.5% if retailers who did not report bag for life sales are included) [16].

- Increase in distribution of paper bags

26. It is possible that some retailers will offer free paper bags, which are out of scope of the charge. However, paper bags involve greater stocking and transport costs to retailers due to their size and weight, and may be considered impractical by some consumers, so a large scale switch is not considered likely to be a major issue. Paper bags are exempted under the carrier bags levy in the Republic of Ireland. Officials there have confirmed that there was no switch to paper in the grocery sector. However, high street retailers did switch to paper bags. The Government has calculated that even if customers of large retailers increase their paper bag use by 50% there would still be a negligible environmental impact in terms of carbon emissions (3,500 tonnes CO<sub>2</sub> equivalent representing less than 4% of the savings from plastic bags.) due to the very low current levels of use. As paper bags are not a substantial issue for the marine environment or long lasting litter, and many of the current uses of them would be exempt under the charge due to size of organisation, charging is not considered necessary.

- **Any wider environmental or sustainability implications of a possible increased use of natural-fibre 'bags for life'.**

27. All bags have an environmental impact. Due to the environmental impact of growing and processing, natural fibre bags such as cotton cloth bags should be reused at least 131 times to ensure that they have lower global warming potential than single use carrier bags.

28. The retailers are currently already charging for plastic bags for life due to the extra cost of producing them. These costs are often higher than the 5p anticipated for single use plastic bags. The plastic bags for life are useful products and environmentally sensible as long as they are re-used, and that is what we expect to happen as consumers change their shopping habits.

- **The relative advantages and disadvantages of the proposed levy rather than a possible complete ban on lightweight plastic bags.**

29. Carrier bags are useful products if used, reused and disposed of responsibly. We do not believe that a blanket ban is the most effective solution for this type of behaviour change. A charge has proven to work in other countries. For example, the Republic of Ireland introduced a levy of 15 cents (13p) on plastic bags in March 2002, rising to 22 cents (18p) in 2007. It has been estimated that usage of plastic bags in Ireland has fallen by over 90% since the introduction of the levy. Wales implemented a charge on single use carrier bags in October 2011 and has seen a fall of 76% in bags distributed. In England we intend to replicate the charging scheme used in Wales (and proposed for Scotland) as closely as practical, in line with our policy aims, unless we receive strong evidence to suggest otherwise through our Call for Evidence.

30. A ban on lightweight plastic bags is currently illegal under the European Packaging Directive and would require a full derogation to the single market for all light weight bags. This would create trade barriers within the European Market and on global trade. The European Commission has tabled a proposed amendment for Member States to reduce their use of lightweight plastic bags, by introducing measures including taxes and levies, national reduction targets or an outright ban. The European Commission's Impact Assessment on measures to reduce the use of plastic carrier

bags considers the option of a ban. A ban would incur significant enforcement costs for enforcing authorities and increase the regulatory impact on small businesses as well as possibly creating trade barriers.

- **The rationale for excluding particular types of retailer from the levy scheme.**

31. In 2011 we introduced a 3-year freeze on new UK regulation for businesses with fewer than 10 employees, including start-up businesses. These will therefore be exempt from the charge.

32. Small businesses with fewer than 250 employees will be exempt from the charge to ensure that they are not disproportionately burdened. The Government wants to encourage re-use of carrier bags. However, there are also costs associated with setting up retail systems to charge and record the sales of carrier bags. These costs may be an additional administrative burden for smaller retailers compared to the number of bags they distribute. These include training staff, developing a method for recording data etc. For large retailers this is likely to be one of many changes made during the course of the year and most large retailers will already have made these changes to comply with carrier bags charges in Wales and Northern Ireland. The Government does therefore not consider it appropriate to extend the charging scheme to small businesses with fewer than 250 employees. However, small businesses are free to introduce a charge, if they wish to.

- **The lessons to be learnt from other countries' experiences in this area.**

33. In developing our proposals we have looked at the charging schemes in Wales, Northern Ireland, the Republic of Ireland and the proposed scheme in Scotland to learn from their experiences. The Welsh Assembly Government and Zero Waste Scotland have conducted consumer research<sup>[17]</sup> to help develop policies, advice, tips and tools to support the reduction of new single carrier bags use. Cardiff University<sup>[18]</sup> has also looked at the attitude change and behavioural spillover effects of the single use carrier bag change in Wales. We intend to learn from the output of both research projects in shaping our scheme.

- **Any social or economic impacts of the proposed bag levy, for example on affordability for particular households or businesses.**

34. The expected reduction in lightweight plastic bag usage, and anticipated trend towards re-usable bags, will minimise the impacts of the charge on consumers. Any extra costs from the charge must be considered against the reduced hidden cost of bags that are given out for 'free' at point of sale. If it is assumed that retailers currently pass on the costs of 'free' plastic bags to consumers through the price of goods, it would be expected that in the competitive retail sector the price of goods may fall marginally when consumers are required to pay for bags.

35. Research from Northern Ireland shows that 66% agree/strongly agree with the levy imposed on carrier bags in Northern Ireland. 76% identified the levy as bringing environmental improvements. On behaviour 77% now sometimes or always bring reusable bags when shopping. 8% have been purchasing new reusable bags. 5% rarely or never use bags when shopping. Only 3% purchase single use bags<sup>[19]</sup>.

36. Surveys of shoppers in Wales<sup>[20]</sup> also showed majority public support for the charge. This increased after the introduction.

- **Any hygiene impacts or wider health impacts.**

37. As in Wales and Northern Ireland, we propose to exempt plastic bags that are solely used to contain unpackaged food intended for human consumption. People should continue to be aware of the risk of cross-contamination when placing food in reused bags.

[1] WRAP, UK Voluntary Carrier Bag Monitoring - 2013 study, July 2013

[2] <https://www.gov.uk/government/consultations/waste-prevention-programme-for-england>

[3] <https://consult.defra.gov.uk/resource-atmosphere-and-sustainability/call-for-evidence-plastic-bag-charge-for-england>

[4] WRAP, UK Voluntary Carrier Bag Monitoring - 2013 study, July 2013, [http://www.wrap.org.uk/sites/files/wrap/Carrier%20bags%20results%20\(2012%20data\).pdf](http://www.wrap.org.uk/sites/files/wrap/Carrier%20bags%20results%20(2012%20data).pdf)

[5] <http://www.wrap.org.uk/content/wrap-publishes-new-figures-carrier-bag-use>

[6] WRAP, UK Voluntary Carrier Bag Monitoring - 2013 study, July 2013

[7] <https://www.gov.uk/government/consultations/waste-prevention-programme-for-england>

[8] <https://consult.defra.gov.uk/resource-atmosphere-and-sustainability/call-for-evidence-plastic-bag-charge-for-england>

[9] <http://www.wrap.org.uk/content/wrap-publishes-new-figures-carrier-bag-use>

[10] [http://wales.gov.uk/topics/environmentcountryside/epg/waste\\_recycling/substance/carrierbags/reduction/?lang=en](http://wales.gov.uk/topics/environmentcountryside/epg/waste_recycling/substance/carrierbags/reduction/?lang=en)

[11] <http://www.seas-at-risk.org/1images/Economic%20impacts%20of%20marine%20litter%20KIMO.pdf>

[12] Galgani et al (2000) 'Litter on the Sea Floor Along European Coasts', [Marine Pollution Bulletin](#)

- 40 (6), pp. 516–527 <http://www.sciencedirect.com/science/article/pii/S0025326X99002349>
- [13] <http://www.mcsuk.org/downloads/pollution/beachwatch/latest2011/Methods%20&%20Results%20BW10.pdf>
- [14] <http://www.seas-at-risk.org/1mages/Economic%20impacts%20of%20marine%20litter%20KIMO.pdf>
- [15] EA 2006 estimates 1.57 kg per month's shopping <http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/scho0711buan-e-e.pdf>
- [16] WRAP forthcoming, Effect of charging for carrier bags on bin-bags sales in Wales
- [17] Exodus Research (2013) Consumer behavioural study on the use and re-use of carrier bags 2012. Zero Waste Scotland [http://www.zerowastescotland.org.uk/sites/files/wrap/Carrier%20bag%20behavioural%20report\\_SCOTLAND\\_FINAL%20V5%2018%207%2013%20v3.pdf](http://www.zerowastescotland.org.uk/sites/files/wrap/Carrier%20bag%20behavioural%20report_SCOTLAND_FINAL%20V5%2018%207%2013%20v3.pdf)
- [18] Poortinga, Wouter, Lorraine Whitmarsh, Christine Suffolk (2013) The introduction of a single-use carrier bag charge in Wales: Attitude change and behavioural spillover effects. Journal of Environmental Psychology 36: 240-247 <http://www.sciencedirect.com/science/article/pii/S0272494413000686>
- [19] MillwardBrown: Research to measure impact of DoE Communications – June 2013
- [20] Poortinga, Wouter, Lorraine Whitmarsh, Christine Suffolk (2013) The introduction of a single-use carrier bag charge in Wales: Attitude change and behavioural spillover effects. Journal of Environmental Psychology 36: 240-247 <http://www.sciencedirect.com/science/article/pii/S0272494413000686>

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