

<b>Title:</b> <b>Reducing and phasing out the horticultural use of peat in England</b> <b>Lead department or agency:</b> DEFRA <b>Other departments or agencies:</b> n/a	<b>Impact Assessment (IA)</b>
	<b>IA No:</b> Defra1063
	<b>Date:</b> 12/05/2011
	<b>Stage:</b> Final
	<b>Source of intervention:</b> Domestic
	<b>Type of measure:</b> Other
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## Summary: Intervention and Options

### What is the problem under consideration? Why is government intervention necessary?

Peat is an important and effectively non-renewable natural asset and the continued extraction of peat for horticulture at the current rate is unsustainable, also contributing to climate change and destruction of important habitats, biodiversity and archaeology. These external impacts and costs of extraction are not reflected in the market price of peat, and Government intervention is necessary to facilitate a shift to peat-free alternatives. Important progress has been made in reducing peat use in response to previous voluntary targets, but the market is still only 58% peat free, and England's consumers and businesses continue to use around 2.4 million cubic metres of peat for horticulture every year.

### What are the policy objectives and the intended effects?

Through a voluntary, partnership approach with the industry, to encourage consumer, retailer, manufacturer and grower behaviour change to significantly reduce peat use in horticulture and make the transition to good quality peat-free products derived from more sustainable by-products or waste products (e.g. coir, green compost). The long-term aim is to work towards reducing to zero the unsustainable use of peat on the basis that all the external costs of extraction are likely to be greater than private benefits. This policy will contribute to the protection of valuable habitats (lowland raised bogs), significant stores of carbon and other ecosystem services. Furthermore it will contribute to the development of a zero waste, resource smart economy and ensure that industry is on a sustainable footing for the medium to longer term.

### What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

Following the consultation, this final Impact Assessment analyses the costs and benefits of the preferred option, of voluntary targets for phasing out peat by: **2013 in soil conditioner products; 2015 in relation to the direct procurement in contracts for plants in Government** and the public sector (new contracts); **2020 in the amateur gardener market** for bagged growing media; and a phase out by **2030 for professional horticulture**, recognising that it may be appropriate for some species, plants and products to have alternative reduction targets and there will be further analysis to refine the details of the policy. Two options were considered in the consultation Impact Assessment, relative to a baseline "do nothing" scenario, 1) voluntary phase out targets for all sectors and markets that use peat, aligning with a long-term ambition to eventually reduce to zero the horticultural use of peat and 2) voluntary phase out targets for all sectors, excluding professional growers of fruit, vegetables and plants.

**Will the policy be reviewed?** It will be reviewed. **If applicable, set review date:** 6/2013

**What is the basis for this review?** PIR. **If applicable, set sunset clause date:** Month/Year

**Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review?**

Yes

**Ministerial Sign-off** For final proposal stage Impact Assessments:

*I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) the benefits justify the costs.*

Signed by the responsible Minister:

 Date: 17/05/2011

# Summary: Analysis and Evidence

# Policy Option 1

**Description:** Voluntary targets to reduce and phase out the horticultural use of peat in all markets, including professional horticulture. Voluntary phase out dates of 2020 for the amateur gardener market, 2015 for Government procurement, 2013 for soil improvers and 2030 for the professional sector (with alternative reduction targets for some species and products (where there are technical constraints) to be further considered)

Price Base Year 2010	PV Base Year 2011	Time Period Years 50	Net Benefit (Present Value (PV)) (£m)		
			Low: - 634	High: 186	Best Estimate: -189

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	238	3	261
High	714	10	785
Best Estimate	476	6	522

**Description and scale of key monetised costs by 'main affected groups'**

- To growing media manufacturers of investing in new technology and using higher cost inputs
  - To professional growers from higher input costs
  - To consumers from higher prices for growing media and plants grown in peat free materials
  - To government, from using higher price peat alternatives in procurement
- Impacts on each group will be determined by the level and speed of price pass through to consumers

**Other key non-monetised costs by 'main affected groups'**

We are not aware of non-monetised costs at this stage.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	n/a	6	149
High	n/a	18	447
Best Estimate	n/a	13	333

**Description and scale of key monetised benefits by 'main affected groups'**

- To society both in England and abroad, from reduced carbon dioxide emissions from peat
- To society both in England and abroad, from large, monetised carbon savings from avoided imports of peat from other countries. 68% of all peat used in horticulture in the UK is imported and monetised benefits from avoiding this proportion are £549m (present value), resulting in a positive net benefit. However DECC guidance suggests these should not be counted on the summary sheet

**Other key non-monetised benefits by 'main affected groups'**

- To society and nature (both in England and abroad), from large, unmonetisable, biodiversity benefits associated with cessation of peat extraction in valuable and rare habitats
- To future generations, from retaining and restoring the carbon sequestration potential of peat bogs.
- To society, from a diversion of green waste from landfill

**Key assumptions/sensitivities/risks**

Discount rate (%) 3.5%

- Discount rate falls to 3% after 30 years
- Calculation of benefits assumes that manufactures and retailers sign up to the voluntary target and make the required reductions. It is assumed that retailers will stop selling imported peat based growing media. The PIR will determine whether sufficient reductions are being made
- Assumes that alternatives to peat of sufficient quality and volumes will become available in time for the targets

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs: 16	Benefits: 0	Net: 16	No	NA

## Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?		England			
From what date will the policy be implemented?		06/06/2011			
Which organisation(s) will enforce the policy?		Defra			
What is the annual change in enforcement cost (£m)?					
Does enforcement comply with Hampton principles?		No			
Does implementation go beyond minimum EU requirements?		N/A			
What is the CO <sub>2</sub> equivalent change in greenhouse gas emissions? (Million tonnes CO <sub>2</sub> equivalent)		Traded:		Non-traded: 7.0	
Does the proposal have an impact on competition?		No			
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?		Costs:		Benefits:	
Distribution of annual cost (%) by organisation size (excl. Transition) (Constant Price)	Micro	< 20	Small	Medium	Large
Are any of these organisations exempt?	No	No	No	No	No

## Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on...?	Impact	Page ref within IA
<b>Statutory equality duties<sup>1</sup></b> <a href="#">Statutory Equality Duties Impact Test guidance</a>	No	15
<b>Economic impacts</b>		
Competition <a href="#">Competition Assessment Impact Test guidance</a>	No	14
Small firms <a href="#">Small Firms Impact Test guidance</a>	Yes	13
<b>Environmental impacts</b>		
Greenhouse gas assessment <a href="#">Greenhouse Gas Assessment Impact Test guidance</a>	Yes	15
Wider environmental issues <a href="#">Wider Environmental Issues Impact Test guidance</a>	Yes	15
<b>Social impacts</b>		
Health and well-being <a href="#">Health and Well-being Impact Test guidance</a>	No	
Human rights <a href="#">Human Rights Impact Test guidance</a>	No	15
Justice system <a href="#">Justice Impact Test guidance</a>	No	
Rural proofing <a href="#">Rural Proofing Impact Test guidance</a>	No	15
<b>Sustainable development</b> <a href="#">Sustainable Development Impact Test guidance</a>	Yes	

<sup>1</sup> Public bodies including Whitehall departments are required to consider the impact of their policies and measures on race, disability and gender. It is intended to extend this consideration requirement under the Equality Act 2010 to cover age, sexual orientation, religion or belief and gender reassignment from April 2011 (to Great Britain only). The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

## Evidence Base – Notes

Use this space to set out the relevant references, evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Please fill in **References** section.

### References

Include the links to relevant legislation and publications, such as public impact assessments of earlier stages (e.g. Consultation, Final, Enactment) and those of the matching IN or OUTs measures.

No.	Legislation or publication
1	Defra research (2010): <b>Costs to the horticultural sector of meeting the UKBAP target on peat use in horticulture.</b> (SP0577) – <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;ProjectID=16169&amp;FromSearch=Y&amp;Publisher=1&amp;SearchText=soil&amp;SortString=ProjectCode&amp;SortOrder=Asc&amp;Paging=10#Description">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;ProjectID=16169&amp;FromSearch=Y&amp;Publisher=1&amp;SearchText=soil&amp;SortString=ProjectCode&amp;SortOrder=Asc&amp;Paging=10#Description</a>
2	Defra research (2010): <b>Monitoring the horticultural use of peat and progress towards achievement of the UKBAP target</b> (SP08020) – <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;ProjectID=17045&amp;FromSearch=Y&amp;Publisher=1&amp;SearchText=soil&amp;SortString=ProjectCode&amp;SortOrder=Asc&amp;Paging=10#Description">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;ProjectID=17045&amp;FromSearch=Y&amp;Publisher=1&amp;SearchText=soil&amp;SortString=ProjectCode&amp;SortOrder=Asc&amp;Paging=10#Description</a>
3	Defra research (2009): <b>Availability and supply of alternative materials to meet the UKBAP target on peat use in horticulture</b> (SP08019) – <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;ProjectID=16850&amp;FromSearch=Y&amp;Publisher=1&amp;SearchText=soil&amp;SortString=ProjectCode&amp;SortOrder=Asc&amp;Paging=10#Description">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;ProjectID=16850&amp;FromSearch=Y&amp;Publisher=1&amp;SearchText=soil&amp;SortString=ProjectCode&amp;SortOrder=Asc&amp;Paging=10#Description</a>
4	Cruickshank, M. and Tomlinson, R. (1997): <i>Carbon loss from UK peatlands for fuel and horticulture.</i> In: <b>Carbon Sequestration in vegetation and Soils</b> (ed. Cannell, M.G.R.), Department of Environment, London
5	Defra research (2010): <b>A preliminary assessment of the greenhouse gases associated with growing media materials</b> (IF0154) – <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;ProjectID=15967&amp;FromSearch=Y&amp;Publisher=1&amp;SearchText=soil&amp;SortString=ProjectCode&amp;SortOrder=Asc&amp;Paging=10#Description">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;ProjectID=15967&amp;FromSearch=Y&amp;Publisher=1&amp;SearchText=soil&amp;SortString=ProjectCode&amp;SortOrder=Asc&amp;Paging=10#Description</a>
6	Department for Energy and Climate Change (2009): <b>Carbon valuation in UK policy appraisal: A revised approach -</b> <a href="http://www.decc.gov.uk/assets/decc/what%20we%20do/a%20low%20carbon%20uk/carbon%20valuation/1_20090715105804_e_@@_carbonvaluationinukpolicyappraisal.pdf">http://www.decc.gov.uk/assets/decc/what%20we%20do/a%20low%20carbon%20uk/carbon%20valuation/1_20090715105804_e_@@_carbonvaluationinukpolicyappraisal.pdf</a>
7	Defra research (2011): <b>The costs of phasing out peat in the hardy nursery stock sector</b> (SP1211) - <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;ProjectID=17646&amp;FromSearch=Y&amp;Publisher=1&amp;SearchText=sp1211&amp;SortString=ProjectCode&amp;SortOrder=Asc&amp;Paging=10#Description">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;ProjectID=17646&amp;FromSearch=Y&amp;Publisher=1&amp;SearchText=sp1211&amp;SortString=ProjectCode&amp;SortOrder=Asc&amp;Paging=10#Description</a>

## Evidence Base

The spreadsheet also contains an emission changes table that you will need to fill in if your measure has an impact on greenhouse gas emissions.

### Annual profile of monetised costs and benefits\* - (£m) constant prices

	Y <sub>0</sub>	Y <sub>1</sub>	Y <sub>2</sub>	Y <sub>3</sub>	Y <sub>4</sub>	Y <sub>5</sub>	Y <sub>6</sub>	Y <sub>7</sub>	Y <sub>8</sub>	Y <sub>9</sub>
<b>Transition costs</b>	see	spread	sheet							
<b>Annual recurring cost</b>										
<b>Total annual costs</b>										
<b>Transition benefits</b>										
<b>Annual recurring benefits</b>										
<b>Total annual benefits</b>										

\* For non-monetised benefits please see summary pages and main evidence base section



Microsoft Office  
Excel Worksheet

# Evidence Base

## Overall policy objective

1. The overall long-term goal is to work towards reducing to zero the unsustainable use of peat in all horticultural markets in England. By significantly reducing and eventually replacing the use of peat in growing media and soil conditioner products that are sold and consumed in England, the objective is to protect valuable habitats, biodiversity and wildlife, carbon stores and other ecosystem services. At the same time, to promote the switch from the consumption of a valuable and essentially non-renewable virgin material (peat) to high quality peat-free alternatives derived from renewable by-products and waste products of other industries, contributing to the development of a more sustainable zero waste, resource-smart economy and, in some cases, reducing the amount of waste to landfill, where innovative solutions are found using new waste materials. Aligning with Defra's objective to increase food production sustainably, making a transition to more sustainable alternatives should also help to ensure the longer-term sustainability of professional horticulture.

## The rationale for action

2. Peatlands are an important part of England's natural capital, playing a vital role in the delivery of many essential ecosystem services. They act as long term carbon stores, are home to rare and threatened wetland habitats, support unique biodiversity and wildlife and preserve important elements of our cultural heritage. As one of our valuable natural assets they underpin our economic prosperity and support our economy.
3. Lowland raised bogs, from which peat is predominantly extracted for horticultural use, are one of Europe's rarest and most threatened habitats. They are also of significant value in terms of biodiversity, supporting internationally threatened and nationally scarce and important species of birds, plants and insects (curlew, nightjar, mire pill beetle, large heath butterfly etc). This biodiversity value to society is recognised in the EU Habitats Directive which sets out additional requirements for this habitat so that good quality sites must be protected *and* uniquely degraded sites restored. With just 5% of the original lowland raised bog remaining in England, this habitat is particularly vulnerable to external pressures, including changes in climate. To improve the resilience of this habitat (and other priority peat habitats under the UK Biodiversity Action Plan, e.g. fens) restoration of degraded habitats (including those outside of the current network of Sites of Special Scientific Interest (SSSI)) is required to provide a coherent ecological network.
4. Whilst new extraction is no longer permitted on pristine habitats in England that have been designated as SSSIs under domestic legislation, even degraded sites (including some currently used for peat extraction) are considered to be priority habitats with significant value at a European level. Moreover, the impact of lowering the water table is felt beyond the extraction sites and is a cause of damage to otherwise protected neighbouring sites. The recent review of England's wildlife sites and ecological networks, *Making Space for Nature*, also emphasised the importance of carbon-rich soils and peatlands, for the multiple benefits to society that they can deliver as well as the habitats and biodiversity they support. The review also recognised that "lowland peat was generally less well protected" than those in the uplands.
5. In England, our use of peat in horticulture far outstrips the volume of peat extracted in England itself. English consumers and businesses are estimated to have used 2.4 million cubic metres of peat in 2009; five times the amount sold by English peat extractors<sup>1</sup>. The largest proportion of this peat is currently imported from the Republic of Ireland, but significant supplies also come from Northern Ireland, Scotland and the Baltic States. English consumption is therefore also responsible for exporting environmental impacts overseas and degrading internationally important habitats, contrary to the principles of the Convention of Biological Diversity. This supports the need for a policy which primarily seeks to reduce the *use* of peat by domestic end-consumers (irrespective of its source) as well as extraction activities.
6. Peat-free materials do not have the same negative impact on biodiversity and carbon storage. Many alternatives are essentially carbon neutral, with the annual growth of plants removing carbon dioxide

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<sup>1</sup> To note that very little peat is extracted in England for domestic fuel use – less than 500 cubic metres in 2009 (Business Monitor PA1007).

(CO<sub>2</sub>) from the atmosphere and the decomposition of this plant material (e.g. through composting) releasing the same amount of CO<sub>2</sub> back into the atmosphere in the same year. By comparison, carbon lost to the atmosphere from the extraction of peat<sup>2</sup> creates a net increase in the quantity of CO<sub>2</sub> in the atmosphere since it had been trapped and taken out of the active carbon cycle many hundreds or thousands of years earlier. If this carbon was to be recaptured through the slow accumulation of new peat (to take it back out of the active carbon cycle) it would again take many thousands of years as peat bogs (in good condition and actively peat-forming) grow at an average rate of 0.5-1mm per year under UK conditions. Based on a growth rate of 1mm per year we could therefore sustainably harvest around 10 to 20 cubic metres of peat for every hectare of active, peat-forming raised bog, suggesting that active English lowland raised bogs could, theoretically, supply less than 2% of the UK's current annual peat use for horticulture on a sustainable basis. Evidence also shows that globally more peat is being lost as CO<sub>2</sub> than is being formed (due to a range of pressures) and that losses are probably being under-estimated. The growth of peat cannot offset all of these losses.

7. The natural environment underpins economic prosperity and we need to manage our natural assets sustainably. The independent UK National Ecosystem Assessment (published in May 2011) recognises that the contribution that ecosystem services make to the national economy in terms of a sustained flow of income is very substantial and that the continued maintenance of this natural capital stock is critically important for the future prospects of a thriving 'green' economy. It recognises the importance of peat for delivering ecosystem services such as climate regulation and notes that the extraction of peat for horticultural use has a net social cost. Defra is committed to encouraging businesses, people and communities to manage and use natural resources sustainably and to reduce waste. The replacement of peat by alternatives fits well with this objective to move to a zero-waste, resource smart economy. Most peat-alternatives are by-products or waste-derived products from other industries and we need to make best use of these materials before further depleting our natural capital.

## Policy approach

8. The central objective of this (voluntary) policy is to address a market failure - the current market price at which peat is sold for horticultural use does not take account of its value as natural capital or the full costs imposed on society by the extraction and domestic use of peat. The impacts of peat use and extraction on habitats, biodiversity and wildlife, climate change and cultural heritage, and the external costs associated with these, are not factored into the current price of peat charged to consumers, including amateur gardeners and professional growers. Factoring the carbon externality alone into the price would lead to a switch to alternative materials.
9. A voluntary approach is being adopted, based on setting phase out targets that reflect evidence on costs, benefits and the future availability of peat-free materials and striking the right balance between environmental ambition (driving innovation and new product development) and achievability. The policy builds on recent progress in reducing peat use in all horticultural markets, but promotes further and faster action to be taken in order to significantly reduce peat use and work towards an eventual and full transition to more sustainable peat-free materials.
10. Previous voluntary targets have had mixed success in driving peat reductions and delivering against reduction targets, but important progress has been made and the key markets (amateur gardener and professional horticulture) are moving in the right direction, having invested in new product development and the sourcing of alternative materials. Some respondents to the consultation expressed concern about the likely success of a voluntary approach given the failure to meet the previous targets (including those from many NGOs and some growing media manufacturers). However, a voluntary approach was supported by a larger proportion of the responses, given the complexities of the challenge and the need to avoid undermining the commercial viability of the UK horticultural industry. A voluntary approach is still seen to be the best way forward, involving a close partnership between and commitment from manufacturers, retailers, Government and the public sector, commercial growers and other interested parties and Non-Governmental Organisations.

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<sup>2</sup> Peat forms by the accumulation of vegetation in waterlogged conditions, where the lack of oxygen slows the decomposition of vegetation to extremely low levels. When peat is drained (and extracted) oxygen re-enters the matrix and the rate of decomposition returns to normal. As vegetation decomposes it releases the carbon taken up by the plant during its growth back into the atmosphere as carbon dioxide.

11. However, as a departure from previous targets which were based on achieving a certain peat-free percentage of the total market, the new policy distinguishes between the different costs, benefits and challenges that the main sectors (i.e. the amateur and professional markets) face in moving away from peat and sets volume based targets. The vast majority of consultation respondents agreed that this was the best / only approach, with only a few expressing concern about the move to volume based targets. The new policy also treats soil improvers and growing media separately, and makes it clearer where the responsibility for taking action lies.
12. Voluntary phase out dates have been determined for the different sectors and different products that use peat, following in depth consultation.
  - **2013** in soil improver products (1.1% of peat use by volume, currently 98.9% peat free). Consultation responses demonstrate almost unanimous support for the early phase out of peat in these products, with the majority agreeing that other bulky organic materials are more appropriate.
  - **2015** for new procurement contracts in Government and the public sector (0.1% of peat use for bought growing media, currently 78% peat free)
  - **2020** in the amateur gardener market for bagged growing media (68% of total peat use, currently 32% peat free)
  - working towards **2030** in professional horticulture (30% of peat use, currently 27% peat free), recognising that there it may be appropriate for certain plants, species and products to have alternative reduction targets where there are technical constraints and there continues to be no technically viable peat-free alternatives over the next 20 years.
13. Success in achieving the voluntary targets will ultimately depend on changes in consumer behaviour - demand-led as a result of increased consumer awareness of the environmental impacts of peat, retail-led as retailers commit to phasing out peat in their stores and product-led as the performance, range and quality of peat-free products continues to improve, building on recent successes. Initially costs fall mainly to individual businesses: growing media manufacturers and professional growers. It is consumers however who should ultimately bear this additional cost.
14. To support the voluntary approach, the Government will continue to work closely with the industry and other stakeholders to address a range of issues that have been raised through the consultation, including in relation to the waste and planning regimes, product standards and labelling for bagged growing media. For the professional sector, a time-limited taskforce will be established to identify the barriers (technological, economic, cultural) to making a transition to peat-free in this sector (and further peat reductions in areas where alternative reduction targets may be proposed) and propose action-oriented recommendations to unblock these and agree a process for dealing with, and regularly reviewing, any alternative reduction targets on the basis of technological and / or economic constraints.

## Geographical coverage

15. Peat policy is a devolved matter, and the geographical scope of this policy is England only use of peat. Recent research (SP08020) supports an England policy focus on reducing peat use with evidence that 80% of UK sales of growing media products are destined for the English market, and with 10% of sales in Scotland and 5% each Wales and Northern Ireland. This reflects the relative concentrations of population (and hence gardeners) and horticultural businesses within the UK (especially container grown ornamentals and soft fruit businesses).
16. Evidence (SP08020) also suggests that the bulk of domestically extracted peat for horticulture is also extracted in England, with significant supply from both Scotland and Northern Ireland and negligible amounts extracted in Wales. However, alternative data collected by the Office for National Statistics (Mineral Extraction in Great Britain: Business Monitor PA1007) reports that the volume of peat sold by extractors in 2009 for horticultural use was 476 thousand m<sup>3</sup> in England, 390 thousand m<sup>3</sup> in Scotland and nil in Wales. Recent calculations suggest that peat extraction in Northern Ireland is much higher, at around 630 thousand m<sup>3</sup>, although at least one consultation response suggests that this is an over-estimate.



17. The Devolved Administrations are considering their own policies on peat protection and the horticultural use of peat. In its recent discussion paper on the management of carbon-rich soils<sup>3</sup>, the Scottish Government stated that:

*“there is a case for a concerted programme to phase out the use of peat, wherever it comes from, in horticulture. These are matters that the Scottish Government expects to discuss with interested parties”.*

18. Action has also been taken in Scotland to promote the use of alternative materials, such as bark and green waste compost. The Welsh Assembly Government is considering the sustainable management of peatlands as part of the development of the forthcoming Natural Environment Framework. We will continue to work closely with all Devolved Administrations on peat protection policy and action to reduce the horticultural use of peat. In wider European and international fora, peat degradation and restoration is increasingly the focus of discussions, for example in the context of the Soil Framework Directive negotiations and the international climate change framework.

## Data sources and research

19. Data sources are taken from a range of research reports that have been commissioned by Defra, as well as other key documents (see references on page 4) and the responses to the public consultation on policy proposals. Defra research reports can be found at <http://randd.defra.gov.uk/> and a summary of consultation responses will be published at <http://www.defra.gov.uk/corporate/consult/peat/index.htm>. A detailed summary of data and research sources is included at Annex A.
20. Defra received over 200 responses to the recent consultation from a diverse range of stakeholders including growing media manufacturers, professional growers, trade bodies, retailers, NGOs, Local Authorities and amateur gardeners. A large proportion answered all 17 questions and provided Defra with new evidence (for example on plants and species for which there is currently no known alternative to peat), as well as a critique of some of the evidence that Defra has commissioned. For example, some of the responses proposed that the 2009 Defra research to estimate projections for future volumes of peat alternatives (SP08019) was either an over-estimate or an under-estimate, depending on the evidence source used. Some of the responses also challenged specific assumptions used in the analysis presented in the consultation Impact Assessment and these have been considered and revised where possible - for example, the underlying assumption on market growth for the baseline scenario has now been adjusted downwards (see paragraph 22).

## Methodology and key assumptions

### *Phase out trajectories*

21. For the purposes of this updated analysis, it is assumed that the decline in peat use will be linear until the phase out dates of 2020 for the amateur gardener market and 2030 for the professional horticulture sector have been achieved. This simplifies the assumptions that were made in the consultation stage impact assessment since, based on consultation responses, we believe a linear trajectory is unlikely to significantly or systematically under- or overestimate the benefits or costs.
22. However, transition trajectories will be different in reality, and it is possible that movement away from peat-based growing media will be slow at first as businesses ramp up the production and supply of peat-free alternatives, undertake additional trialling of products and production processes and deliver against existing contractual commitments for peat containing growing media. Equally, transition for some businesses and subsectors may be faster at first, as cost-effective easy wins (where not already made) and new market opportunities are exploited. Some businesses that have already made progress in moving away from peat may be able to switch to peat free materials quickly.

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<sup>3</sup>C.f. Page 14 of the discussion paper, published in December 2010: <http://www.scotland.gov.uk/Topics/Environment/waste-and-pollution/Pollution-1/soil/soilpolicy/carbon-rich/>

## Baseline scenario

23. To estimate the likely magnitude of the benefits, a realistic baseline scenario is required, capturing the expected future use of peat in the horticulture industry *without* a new policy. For the purposes of this analysis we use a 0% market growth baseline scenario, which implies that any growth in the market would be made up of alternatives and the volume of peat used remains static. This is a change from the assumption used in the consultation, which reflects a number of consultation responses that suggested our previous 2% market growth scenario was unlikely, as this represented an unrealistic expansion of the market.

## Cost Benefit Analysis

### Benefits

24. Actions to reduce and eventually phase out the horticultural use of peat will deliver a range of environmental benefits to society. However, based on current levels of scientific and economic understanding, only climate change benefits can be quantified, valued and monetised for this impact assessment. Benefits are derived by estimating the annual volume of peat that would not be used as a consequence of this policy. For these annual quantities of 'avoided' peat use, the carbon dioxide emissions in metric tons can be calculated and multiplied by the price per ton of carbon<sup>4</sup>. Finally, the monetised annual emissions savings are discounted using the standard short term discount rate of 3.5% for the first 30 years, falling to 3% thereafter in accordance with current HM Treasury Green Book guidance.
25. In the consultation impact assessment, costs and benefits were estimated up to the year 2030 to emphasise initial estimates of the immediate costs of taking policy action. The updated analysis here has been carried out up to the year 2060, over a 50 year appraisal period to ensure a fuller consideration of the policy's ongoing costs and carbon savings over its lifetime<sup>5</sup>, given that costs are front-loaded but benefits accrue over a long time horizon.
26. In accordance with DECC guidance, only benefits from phasing out the domestic extraction of peat are presented in the summary sheets of this Impact Assessment and in the discussion here. However, recognising that climate change is a global phenomenon, avoided emissions from imports should be taken into consideration and the benefits associated with reducing overseas peat extraction are included in Table 1. Benefits have been calculated by multiplying the DECC carbon price with the avoided emissions due to a reduction in the use of peat. The detailed methodology for calculating the benefits is outlined in Annex 3.

*Table 1 Emissions savings and monetised Benefits*

	England only	International savings	England and International
<b>Total Emissions Savings in MtCO<sub>2</sub></b>	7	14	21
<b>Total Benefits</b>	£333m	£549m	£882m
<b>Professional Sector Emissions Savings</b>	2	4	6
<b>Professional Sector Benefits</b>	£94m	£159m	£253m
<b>Amateur Sector Emissions Savings</b>	5	10	15
<b>Amateur Sector Benefits</b>	£240m	£390m	£629m

### Costs

27. The costs of taking action to reduce and phase out peat use predominately relate to the higher per unit cost of peat free alternatives (as peat is currently under-valued by the market), any investment in new machinery (additional to anticipated upgrades in the normal course of business) or changes

<sup>4</sup> Carbon Valuation in UK Policy Appraisal: A Revised Approach, Climate Change Economics, Department of Energy and Climate Change, July 2009

<sup>5</sup> As stated in the Green Book (2003): "Costs and benefits considered should normally be extended to cover the period of the useful lifetime of the assets encompassed by the options under consideration, although, if the appraisal concerns the contractual purchase of outputs and outcomes (e.g. in PFI), the appraisal period may be different."

in production processes which may be necessary to adapt to growing media materials with different physical or chemical characteristics.

28. The evidence on costs presented here is derived from an initial survey by ADAS (SP0577) that was carried out in 2009 (see Annex 2) to gauge the magnitude and distribution of costs for industry (growing media manufacturers and professional growers). Estimated costs should be regarded as indicative only given that underlying data is not based on statistically representative samples, and although analysis has been further informed by consultation responses and subsequent research on the hardy nursery stock sector (SP1211) this has not provided sufficient data to revise costs.
29. The total costs of this voluntary policy are calculated by assuming a transition period of 20 years over which the annual costs described in tables 2 and 3 occur and adding the ongoing, higher raw material costs of peat free materials thereafter up to 2060. Thus the total discounted cost of this is £522m for both the professional and the amateur sector up to 2060. The bulk of this consists of transition costs.

#### *Amateur sector*

30. Amateur gardeners currently use around 70% of the peat that is used for horticulture in England. Historically this has been around 1.6 million m<sup>3</sup> per year. Costs arising from the phase-out of peat in amateur gardening mainly derive from increased raw material costs of peat-free alternatives and investments in new machinery and infrastructure which growing media manufacturers may need to make in order to work with a range of materials with different characteristics to peat.

Table 2 Annual costs to the amateur sector, 100% phase out

	<b>Best Estimate</b>	<b>Pessimistic</b>	<b>Optimistic</b>
<b>Net capital cost, £m (transition)</b>	3	5	2
<b>Net cost of substitutes per cubic metre, £ per m<sup>3</sup></b>	2	3	1
<b>Net other costs, £m (transition)</b>	< 1	< 1	< 1

31. Table 2 lists the estimates produced by ADAS (2009) scaled for a 100% phase out. In the analysis carried out for this impact assessment, a net price differential between peat and peat free growing media of £2/m<sup>3</sup> has been used<sup>6</sup> (£3/m<sup>3</sup> for the pessimistic and £1/m<sup>3</sup> for the optimistic sensitivity analysis) based on responses received during the consultation. A price differential per m<sup>3</sup> (rather than a lump-sum annual amount as suggested by ADAS) has been used for this analysis to better account for the cost dynamics created by gradual phase out, and to better reflect the consultation responses on the price differential.
32. It is expected that the cost of capital investments for companies that go peat free will go down over time, as the technology becomes more widely available, knowledge exchange takes place and with innovation. In order to capture this effect in the analysis, annual costs are taken to reduce by 2% year on year. This presents a small departure from the figures presented in the ADAS research and is a simplifying assumption since in reality the reduction in costs would not necessarily follow an equal percentage trajectory. However, it is reasonable to expect such dynamics taking place given precedents with environmental standards and product innovation.
33. Finally, to note that one potential cost that is not readily quantifiable is the cost to individual amateur gardeners. Retailers may choose to pass through the increased cost of peat-free materials, although current industry opinion is that there is limited scope for full or partial cost pass through. If price pass through is possible, costs to consumers will present a transfer from business.

#### *Professional sector*

34. Professional growers of fruit, vegetables and plants<sup>7</sup> for sale to amateur gardeners, consumers and businesses use around 30% of the peat that is used in horticulture. Historically, this has been around 0.7 million m<sup>3</sup> in England per year. For this analysis it is assumed that this sector also encompasses the use and procurement of peat-based products and plants by Local Authorities and landscaping, as the professional horticulture sector also supplies the plants for these smaller

<sup>6</sup> A price differential per m<sup>3</sup> (rather than a lump-sum annual amount as suggested by ADAS) has been used for this analysis to better account for the cost dynamics created by gradual phase out, and to better reflect the consultation responses on the price differential.

<sup>7</sup> The professional sector refers to the commercial horticultural industry and covers both food and ornamentals production.

sectors. It is likely that some LAs will face, at least initially, higher costs for some peat-free plants (dependent on the plant species and supplier), although some consultation responses from LAs who have already made the transition have not raised higher costs as a barrier to change. However, data limitations mean that it is not possible to analyse further at this stage, and all costs have been attributed to professional growers

35. In phasing out peat, professional growers may face an increase in the net costs of growing media on a per-volume basis and may also need to make changes to existing production processes (to cope with the different physical and chemical characteristics of peat-free materials) which could be associated with cost increases. Consultation responses have highlighted that the transition away from peat could result in reduced productivity and higher failure rates, and therefore a need for growers to carry out more extensive trials with new growing media mixes (and with a potentially higher insurance risk attached). There may also be increased management / resourcing costs as a result of the increased weight and different physical characteristics of alternatives if workers need to spend longer handling plants or follow a more complex and / or time intensive watering and feeding regime. However, there may be resourcing savings for some companies (for example, as liverwort does not need to be controlled with some alternative materials) and the extent of trialling, capital investment and potential plant failure rates / risks will differ widely across the heterogeneous professional sector.
36. The cost analysis for the professional sector again draws on initial Defra research (SP0577) and should be considered as indicative estimates. The cost components for phasing out peat in the professional sector are presented in Table 3.

*Table 3 Annual costs to the professional sector, 100% phase out, England only*

	Best Estimate	Pessimistic	Optimistic
<b>Net capital cost, £m (transition)</b>	£5m	£7m	£2m
<b>Net cost of substitutes, £ per m<sup>3</sup></b>	£4	£6	£2
<b>Net other costs, £m (transition)</b>	£2m	£3	£1
<b>Net reduction in revenue<sup>8</sup>, £m (transition)</b>	£48m	£72m	£24m

37. Costs<sup>9</sup> have been calculated by adding up annual transition costs (as presented in Table 3) over the transition period to 2030, and adding the net costs of the alternative growing media, which are calculated on the basis of phased out volume. It is assumed that there will be complete compliance with this policy for the purpose of calculating the costs (and benefits). The net costs of the growing media have been taken to be £4/m<sup>3</sup> for the best estimate (£6/m<sup>3</sup> for the pessimistic scenario, £2/m<sup>3</sup> for the optimistic scenario)<sup>10</sup> As with the amateur sector, costs have then been averaged over the transition period to account for the expected decrease in transition and raw material costs over time due to increased entry and competition as well as cost improvements due to innovation which will follow from a greater demand for peat free alternatives and production processes.
38. Finally, it is important to put the potential increases in costs associated with this policy in context with some of the other costs that are routinely faced by English growers. For example, new evidence (SP1211) suggests that the labour costs of hardy nursery stock growers generally range between 30 and 45% of their businesses' annual turnover. Consequently, annual wage increases of the order of 3%<sup>11</sup> (agricultural and horticultural sector) over the last decade are thought to have had a considerable impact on overall costs for individual businesses. These additional labour-related costs seem to have been passed on to consumers through product prices, or they may have been absorbed through efficiency gains.

<sup>8</sup> Net reduction in revenue, as covered in the research by ADAS (SP0577), cover losses to businesses as a result of for example less efficient production processes, lower product quality, higher labour costs and increased plant failure.

<sup>9</sup> The costs (and benefits) presented here exclude the mushroom sector, as the initial costing research was not able to estimate how much complete phase out would cost the sector. The mushroom sector utilises 1% of all horticultural peat used in England.

<sup>10</sup> This uses a range of estimates for the net price differential of peat free alternatives, and scaling the transition costs by 0.5 for the optimistic, and 1.5 for the pessimistic scenario.

<sup>11</sup> Defra Survey of Earnings and Hours of Agricultural and Horticultural Workers

## Summary of costs and benefits

*Table 4 Estimated monetised net benefits of phasing out peat use (best estimate), NPV in £m*

	Total	Professional	Amateur
<b>Net Benefit</b>	-189	-268	79
<b>Benefit (England only)</b>	333	94	240
<b>Cost</b>	522	362	161
<b>Net Benefit, including external benefits</b>	360	-109	469

39. The overall net present value of the policy (based on an assessment of quantifiable climate change benefits only) and again in the amateur sector is strongly positive. The comparatively higher costs of taking action in professional horticulture mean that a negative net present value is associated with this market, hence why the possibility of alternative reduction targets for certain plants and species is being explored.
40. The net present value becomes more positive across all sectors when taking into account overseas emissions savings, reflecting the comparatively large benefits associated with reducing the peat which is imported (more than 50% of peat used in England). It is also important to remember the potential benefits of this policy which have not been captured by the monetary analysis, particularly in relation to biodiversity.

## Risks and unintended consequences

41. For the purpose of this impact assessment, it is assumed that this voluntary policy will be successful in delivering a phase-out of peat use in all markets, in line with the phase-out dates. However, a comprehensive policy review will be carried out within 3 years (drawing on data on peat sales for 2011, 2012 and 2013) and will consider whether the pace of progress is sufficient and whether additional policy measures are necessary.
42. During the consultation, a key risk which has been highlighted has been the potential to introduce perverse incentives to peat extractors with large peat bogs. A complete phase-out may create an incentive to extract and sell greater quantities of peat before the bogs lose their extraction value after the phase out dates. This would mean that companies would be willing to sell peat at lower prices (possibly even below marginal cost, as overheads such as bank loans still have to be serviced). To deliver ambitious targets, year-on-year reductions in peat use are expected and annual monitoring of peat sales and the policy review will gauge whether unintended consequences have been introduced.

## Specific Impact Tests

### Small Firms Impact Test

43. The UK has a specialised horticultural industry, with many very small businesses growing single and / or specialist types of plants. The initial research into the costs of phase-out (SP0577) estimated that of the over 10,000 commercial horticultural holdings, 64% have less than one full time equivalent worker and just 10% have more than five. There are two effects which may be experienced by small businesses as a consequence of phasing out peat. One is that small businesses will be affected negatively by this policy, as there are few incentives for growing media manufacturers to develop growing media tailored to their specific plants' needs. Thus they may have to trial their own mixes and vary nutrient and watering regimes. The second effect may work rather more positively in that some smaller businesses may have more flexible, less mechanised production processes, which can be adapted more easily than those of large companies. Specialist growers may also be more effectively insulated from European competition, as small growers have found a market niche compared to some of the big producers who serve the large supermarket and DIY garden chains. Small businesses may also have the flexibility to grow different varieties and species, and may thus be able to adapt effectively to the qualities of new growing media. However, some specialist growers will be growing species that are adapted to peat (based on their original

habitat) and will benefit from the proposed alternative reduction targets to be developed for these species.

44. The consultation has shown that concerns about the impacts and practicalities of this policy have been voiced by both small and large businesses alike. However, in their consultation response, the National Trust suggests that it is medium sized businesses that will face higher costs of transition compared to that of small or large businesses. "Within the professional sector, our experience suggests that the very large and the small nurseries seem to be moving to peat-free alternatives with very little trouble. However, the medium scale operations seem to find the transition more difficult to achieve as they have neither the economy of scale to ease financial outlays or benefits of the requirements of a small/specific range of plants to cater for. Large wholesalers will find moving to peat free for propagation difficult for technical and financial reasons."

## Competition Assessment

45. This voluntary policy to phase out the use of peat in horticulture may impact on competition in two ways<sup>12</sup>. It may:
- indirectly limit the number or range of suppliers (growing media manufacturers, professional growers)
  - limit the ability of these suppliers to compete effectively in the marketplace
46. The number or range of growing media manufacturers may be indirectly limited where business models are currently structured around peat supplies and they are unsuccessful in moving to alternatives, in particular to supply the amateur gardener market (69% of peat use). The growing media market has seen a period of gradual consolidation, and the supply of growing media products sold into the amateur gardener and professional horticulture markets is now dominated by a few large manufacturers who are able to service the national distribution requirements of the large retail chains, source the right quality of raw materials and invest in the more sophisticated mixing equipment that is required for specialist commercial uses. However, it is not thought that manufacturers would go out of business as a result of this voluntary policy as most already have successful peat free product lines, having invested in new product development and machinery over recent years, and are now well placed to make a transition.
47. On the other hand, this policy emphasises the future direction of travel and clearly provides a market signal that should enhance the range and number of peat-free manufacturers and suppliers of peat-free materials, such as those based on wood-fibre, bark, coir and high quality green compost. This is a continuation of a trend that various policy targets since the 1990s have attempted to expedite, and will therefore have already been in the line of sight of industry. Consultation responses have suggested that there is additional scope for increased exports of coir dust (a secondary by-product following the removal of coir fibre) from India and Sri Lanka, in part driven by rising demand for primary by-products (coir fibre) from China, and there are several coconut-producing countries in South East Asia and Africa which are so far untapped in terms of the potential to develop export markets for coir to overseas growing media markets, including in the UK. Similarly, a clear signal that the market will be peat free in the long run should make entry to the alternatives market a lucrative option and could lead to more vigorous competition and a greater diversity of suppliers in the peat-free market, with resulting improvements in product performance and price.
48. Whilst it is anticipated that retailers will commit to not selling peat-based bagged growing media from overseas, the ability of especially professional growers, may be limited in the short run, recognising the large import penetration of the UK market (68% of the total market). English producers are likely to face some increased production costs (e.g. given the current differential between peat and peat-free materials), and overseas competitors that are not required to dramatically reduce or phase out peat use may therefore gain a cost advantage in any cases where retailers favour cheaper imported plants. However, whilst there are no current plans for other European countries to phase out peat in horticulture, there may be insulating factors which may buffer domestic producers from increased price competition from abroad. At the same time, many English grower businesses are likely to have a competitive edge over overseas producers on price, quality or environmental / ethical grounds (e.g. given preferences to buy peat-free or British products), or a combination of these factors. As a result of this policy, domestic producers are also likely to have a strong incentive to increase their

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<sup>12</sup> As defined in the OFT guidance on competition specific impact tests at [http://www.of.gov.uk/shared\\_of/reports/comp\\_policy/oft876con.pdf](http://www.of.gov.uk/shared_of/reports/comp_policy/oft876con.pdf)

overall efficiency, review their production processes and seek to lower their costs in order to maintain their competitiveness.

49. Finally, an increase in consumer awareness of the environmental impacts associated with peat use may allow producers to pass on full or partial costs to consumers, and this would also help to insulate them against the potential impacts of foreign price competition. Consultation responses have highlighted widespread doubt about the potential to pass through full or substantial costs, and whilst it is recognised that price pass is unlikely to be 100%, it is equally unrealistic to assume that no additional costs of transition could be passed on. Recent research into the hardy nursery stock sector (SP1211) has also shown that some producers in this sector have been able to raise prices because of the weakening of the pound sterling after 2008.

## Equality Impact Assessment

50. None of the policy options are considered to have implications for equality or relate to an area where there are known inequalities, and therefore it was judged that undertaking such a detailed assessment was not relevant.

## Wider Environmental Issues

51. Monetised and un-monetised environmental benefits are discussed in the Rationale for Action. Policy proposals seek to remove peat-based products from the growing media market in England *within* the next twenty years. As an additional note on climate change adaptation, it is difficult to assess whether transition away from peat will make the market or society more exposed to climate change within this time frame or in the future. However, evidence does suggest that domestic peat soils are likely to be vulnerable to climate change and temperature increases – which may either reduce the amount of peat that is available for extraction and suitable for growing media or prompt more stringent protection policies by Government. Whilst it is likely that it will always be possible to import peat from overseas (Ireland, the Baltics) for the right price, it is arguable that by broadening out the number of dominant materials from domestic sources (green waste compost, wood fibre and other wood-based products etc.) that the growing media market may eventually be more resilient to climate change impacts.

## Human Rights

52. None of the policy options are considered to have implications for human rights. Through the consultation process some concerns have been raised with the production of coir in India and Sri Lanka, but further discussions with experts has shown that this has already been addressed. Coir producers have already had to amend their policies and operations to supply European markets with strong Corporate Social Responsibility standards. This includes improving working conditions for the labour force and the exclusion of child workers. Moreover, given the growing competition for labour within these countries there is already a move towards greater mechanisation of production.

## Rural proofing

53. Some industry restructuring may be necessary as a consequence of industry responses to this policy. Some growing media manufacturers have considerable raw material assets in the form of peat bog reserves and the major manufacturers of growing media supplying the UK markets have been traditionally located close to peat extraction sites but remote from the end user, for example in the north-west of England, Somerset, Northern Ireland and the Republic of Ireland. With the shifting emphasis to the use of peat-free alternatives, these remote locations are often not ideal logistically to support restructuring, including to take advantage of materials (such as coir) that are imported via cargo ship and manufacturers who have historically invested heavily, or solely, in peat-based assets will therefore face higher transitional costs associated with the location of their infrastructure. In contrast, new growing media companies that have emerged over recent years have been located near to their own locally sourced materials, for example those using green compost as a major ingredient. Green compost is a recovered waste product from for example gardening activity and may hence be sourced closer to towns and cities.

## Annexes

### Annex 1: Post Implementation Review (PIR) Plan

<p><b>Basis of the review:</b> A political commitment has been made to review the policy within 3 years.</p>
<p><b>Review objective:</b> To assess progress in phasing out the use of peat in horticulture.</p>
<p><b>Review approach and rationale:</b> The precise approach to the review is still to be decided following information gained from the consultation, but is likely to include an assessment of annual monitoring data (of peat sales) and revised supply projections (of peat-free alternatives). A light touch approach is proposed to avoid creating excessive burdens on the industry, particularly given the voluntary nature of the policy.</p>
<p><b>Baseline:</b> Baseline monitoring data exists, and is discussed elsewhere in this IA. Regular monitoring exercises of growing media sales took place in 1999, 2001, 2005, 2007 and 2009.</p>
<p><b>Success criteria:</b> Quantitative success criteria for the review are still to be determined.</p>
<p><b>Monitoring information arrangements:</b> The consultation proposed that progress should be monitored on an annual basis, with industry data collected by Defra from growing media manufacturers in January/February and published by the end of March/April in the same year. This would focus on the volume and source of peat used for horticulture. However, following responses to the consultation, the precise method for compiling and presenting data is still to be determined.</p>
<p><b>Reasons for not planning a review:</b> N/A</p>



## ANNEX 2: Data sources and research

54. Baseline data on volumes of peat and alternatives are taken from the Defra project SP08020: Monitoring the horticultural use of peat and progress towards achievement of the UKBAP target (2010). This is the latest in a series of surveys to monitor the use of peat and alternatives in the UK (1999, 2001, 2005, 2007). It provides data on volumes of peat and alternatives sold in the UK during 2009 for growing media and soil improvers in four markets: Amateur gardening, Professional growers, Landscaping and Local Authorities. The details of future monitoring arrangements are now being considered in the light of consultation responses and options will be discussed with stakeholders over coming months. A new survey will be carried out in early 2012.
55. Alternative data on volumes of peat use in horticulture are taken from the Office of National Statistics annual minerals survey carried out for the Department for Communities and Local Government and the Department for Business, Innovation and Skills - Mineral Extraction in Great Britain: Business Monitor PA1007 (2009). This is the latest in a series of annual surveys to monitor the sales of peat (and other minerals) extracted within Great Britain for use in horticulture and other uses (including energy).
56. Data on projected volumes of peat-free alternatives are taken from the Defra project SP08019: Availability and supply of alternative materials to meet the UKBAP target on peat use in horticulture (2009). This project estimated, based on interviews with suppliers, the availability of alternative materials for use in growing media over the next 10-15 years (until 2025) and assessed whether the sourcing of these could potentially be a barrier to further peat reductions. We have used this preliminary data in our analysis, but results should be treated with some caution. Most interviewees had less confidence when predicting availability more than five years ahead, in part because it will be dependent on developments in other industries. Several consultation responses suggest that projections are already out of date and that the study will need to be repeated, although respondents were divided on whether the results potentially over-estimated or an under-estimated future supplies depending on their evidence sources. The intention is to undertake a similar research exercise in 2013 to examine how the availability of alternatives has changed, the impact of competition for source materials for energy generation and to generate updated estimates of future supplies.
57. Data on indicative costs to the industry of switching to alternatives are predominantly taken from the Defra project SP0577: Costs to the horticultural sector of meeting the UKBAP target on peat use in horticulture (2010). This project developed interview-based case studies (24) for different industry sectors, identifying the estimated costs of different levels of peat replacement and then scaling up results to calculate costs for the whole UK industry. The project was intended to provide an initial estimation of the general magnitude and distribution of costs and, as a very small number of case studies were used, the data is not fully representative of individual subsectors and should be treated with some caution. In particular, the 14 case studies of professional growers offer a partial picture of the 10,000+ diverse commercial horticultural holdings in the UK. The professional sector is heterogeneous, with businesses specialising in different crops and relying on different inputs and production processes, ranging from the highly mechanised to largely labour-driven, and operating on different commercial scales. However, the 6 case studies of growing media manufacturers account for a high proportion of the peat used by this sector (estimated at 60-70%) and this data is considered to be more representative of the industry. Consultation responses highlighted particular sectors where there are technical barriers to phasing out peat use and for which the costs of transition could be much higher (and where alternative reduction targets should therefore be considered), whilst other responses suggested that for some groups the costs of phasing out peat use could be considerably lower.
58. During the consultation, Defra commissioned a further study (SP1211) on The costs of phasing out peat in the hardy nursery stock sector (2011). The preliminary costing project (SP0577) had assessed 4 case studies for this sector, however this sector was estimated to use 41% of the peat used by the professional sector and based on these 4 case studies accounted for over 50% of the costs to the professional sector (almost 3 times the cost of the next most expensive sector). The new research focused on undertaking a detailed qualitative assessment of a larger and diverse range of 25 case studies in the hardy nursery stock sector to more fully explore the costs, benefits and issues associated with switching to peat-free alternatives. The research highlights that the main cost associated with moving away from peat is likely to be the higher price of peat-free materials, with growing media costs making up 4-5% of the company's annual turnover (compared to 30-40% for labour). Investment in new machinery was also not considered to be necessary for the hardy

nursery stock sector, but there were widespread concerns about the cost and consistency of trialling and the potential for higher failure rates or 'grade out' (i.e. poor quality plants) with peat-free growing media mixes.

59. Emission factors for carbon dioxide (CO<sub>2</sub>) emissions associated with peat extraction are taken from the 1997 paper by Cruickshank and Tomlinson on carbon loss from UK peatlands for fuel and horticulture (see references) and represent only the emissions associated with the decomposition of the peat that is extracted (i.e. taken out of the ground). These are applied to the volume of peat not used in comparison to the 'do nothing' baseline scenario to generate values for emission savings.
60. Contextual information on the greenhouse gas emissions associated with alternative growing media products is provided by the Defra project IF0154: A preliminary assessment of the greenhouse gases associated with growing media materials (2010). The project was a preliminary assessment of the subject and has revealed a number of methodological and interpretation issues which will require further research to resolve and, as a consequence, results and conclusions should be treated with some caution at this stage. However, the results of this research were not used in the analysis. It found that peat-free alternatives generally have similar or lower greenhouse gas emissions associated with their production and transport compared to peat. Moreover, when net emissions to the atmosphere are taken account of, the research demonstrates that peat-free materials have lower net emissions and can in fact be 'carbon neutral' or even sequester carbon. It also concluded, based on the difficulties involved in calculating and interpreting greenhouse gas emissions from growing media materials based on current science, that "the major driver for reduced peat use should remain its 'non-renewability' and potential for long-term in-situ carbon storage rather than its emissions of greenhouse gases", where 'non-renewability' refers to the age of the carbon and time it takes (hundreds and thousands of years) to 'recapture' and 'sequester' the emissions to the atmosphere from its extraction and use.
61. Contextual information on European and global growing media markets and peat policies is drawn from recent Defra studies: a Review of international policies and experience on peat (extraction, management and restoration) (SP0565) and a Review of growing media use and dominant materials (peat and alternatives) in other countries (European and international) (SP1206). A number of consultation responses have also offered useful insights into wider market dynamics and the constraints and opportunities in relation to the supply of alternative materials.
62. A Defra project on the biodiversity basis of the UK BAP target for the reduction in use of peat in horticulture (SP0573) referred to in various consultation responses is still not complete. The draft report has been peer reviewed and is now being revised in response to the wide-ranging comments received.

## ANNEX 3: Costs and Benefits – Detailed methodology and assumptions

### *Calculation of climate change benefits*

63. Climate change benefits have been predominantly assessed by calculating the projected volumes of peat that will not have been consumed, and hence emissions which will not have been released into the atmosphere if the policy is successful in dramatically reducing and eventually phasing out peat. This is based solely on the off-site emissions from the eventual decomposition of the extracted and utilised peat. On-site emissions are not currently estimated and it is not possible to separate out emissions associated with the processing and transport of peat (based on energy use). Additional emissions from the use of peat-alternatives have not been included because i) many are carbon neutral, ii) they are bi-products and waste products and most emissions are associated with the main product produced, iii) it is not possible to separate out emissions associated with the processing and transport of alternatives (based on energy use), or the methane emissions associated with the composting of green waste for horticultural use.
64. Current DECC guidance on calculating the benefits from CO<sub>2</sub> emission reductions stipulates that only the benefits which arise from phasing out domestically extracted peat can be taken into consideration when assessing the cost and benefits of policy options. The benefits of this policy are therefore estimated taking only the 32% of the peat used in England which is extracted from UK sites as a basis.
65. However, the overseas climate change benefits which result from phasing out the domestic use of peat (and therefore reducing peat extraction from other European sites) have also been calculated, as total emissions are of concern when considering climate change. It may be that extracted peat from lowland bog reserves overseas could be absorbed by other markets if it were not destined for the UK, but such secondary effects are not taken into account in government impact assessment appraisal, following official BIS guidance<sup>1</sup>.
66. Overseas benefits have been calculated using the DECC traded carbon price. This is a pragmatic modelling choice given that many products which feature heavily amongst UK imports are often covered by the EU emissions trading scheme (ETS). Peat imports, which are not covered by the ETS, are nevertheless valued at the traded price in order to comply with DECC guidance, which aims to create a basis of comparison for imported emissions.

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<sup>1</sup> <http://www.bis.gov.uk/assets/biscore/better-regulation/docs/i/11-518-impact-assessment-toolkit.pdf>