March 2017

The future composition of polymer banknotes — a consultation paper
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1 Background and executive summary

As announced on 15 February 2017, the Bank of England is undertaking a consultation to seek the views of the public on options for the future composition of polymer notes, namely the next £20 note and future reprints of the £5 and £10. This will allow the Bank to understand better the range of public opinion. The Bank recognises the concerns raised about the discovery that traces of animal-derived additives were used in the production of its £5 polymer notes. It respects those concerns and is treating them with the utmost seriousness.

As set out in the statement of 15 February, the Bank concluded that it would be appropriate to keep the £5 polymer note in circulation and to launch the £10 polymer note, as planned, in September 2017. In reaching its decision, the Bank considered the public impact on immediate note supply, the set-back in counterfeit resilience of withdrawing polymer notes, the costs involved in destroying and reprinting polymer £5 and £10 notes already printed and its obligations under the Equality Act 2010.

This consultation:

• provides information on the Bank’s role and objectives in note issuance, the rationale for the adoption of polymer notes and the production process for notes;
• describes the role of animal-derived additives in the production of polymer notes and sets out alternative options;
• highlights the potential environmental and social impacts associated with the use of additives sourced from tallow, coconut oil and palm oil; and
• describes the Bank’s responsibilities under the Equality Act 2010 and identifies those groups which the Bank understands may potentially be affected and in what way.

The Bank has spoken to a number of interested parties, namely potentially affected religious groups; groups representing vegans and vegetarians; and environmental organisations. These meetings have helped to inform the Bank’s thinking as well as the contents of this consultation document. The Bank also commissioned an independent report on the environmental impact of a range of additives from a consultancy firm, Efeca. The Efeca Report is published alongside this consultation.

The animal-derived additives are chemicals commonly used in trace amounts by global manufacturers of polymer that are used for a wide variety of everyday products. Ultimately the chemical additives used in the initial manufacturing of this polymer are derived from tallow, a by-product, mainly from livestock farming. For notes, the polymer is then coated with white inks (‘opacified’) to make the polymer ‘substrate’, on which the note design is printed. The amount of polymer used for notes represents a tiny fraction of global annual production.

The production of secure notes is complex. The development and launch of a new note can take four years or more. The tender for the £20 substrate has been put on hold to accommodate a decision on the future composition of the polymer used, but the Bank needs to take a decision soon in order to be able to launch the new £20 polymer note by 2020. Since December 2016, the Bank has been working with De La Rue and Innovia Security, the international producers of polymer substrate, to assess alternative options, such as palm oil or coconut oil. Their conclusion is that the only practical alternative to animal-derived additives are additives derived from palm oil, which offers a mature supply chain. While palm oil is a very high-yielding crop, there are a number of identified environmental impacts, which are set out more fully in the Efeca Report. These can be potentially mitigated by the Bank’s suppliers acquiring additives that meet an associated certification standard for environmentally sustainable production.

(1) At the same time, the Bank published the assessment underlying its decision, www.bankofengland.co.uk/publications/Documents/other/polymерassessment.pdf
(2) Efeca are independent consultants with experience in over 30 countries, providing specialised advice on responsible sourcing, sustainable trade and the use of natural resources in manufacturing, including palm oil.
In reaching a decision about the future composition of polymer notes, the Bank will weigh up a range of considerations in addition to the responses to this consultation. A substrate produced using palm oil must meet the technical and operational requirements to enable the manufacture of secure notes in high volume. The Bank has been working with De La Rue and Innovia Security to gain assurance and they are confident that it should be technically possible. The Bank and its suppliers also need to be confident that this alternative can be supported by a reliable supply chain. This is work in progress but both suppliers would aim, subject to technical and commercial feasibility, to target mass balance certification, under the RSPO framework, towards the start of production of the £20 polymer note. They are working to do so before the Bank makes a final decision. The Bank will also want to ensure that any alternative does not materially increase the cost of production, which is ultimately borne by the taxpayer.

The Bank will reflect upon the various religious, ethical and environmental considerations raised by the inclusion of animal-derived additives and palm oil as the alternative. In doing this, the Bank will pay careful regard to its responsibilities under the Equality Act 2010.

Taking into account the information presented in this consultation paper, the Bank invites views on the following questions.

Q1 Do you have a view on the use of animal-derived additives in the production of polymer substrate? If so:
   a. What is your view?
   b. Please explain why.

Q2 Do you have a view on whether the Bank’s suppliers should move to using additives derived from palm oil as an alternative to animal-derived additives? If so:
   a. What is your view?
   b. Please explain why.
   c. Is your view dependent on whether the Bank’s suppliers use sustainable palm oil? If so, is your view dependent on the type of sustainability certification standard that could be achieved by the suppliers (see Section 6 for an explanation of these)?

Q3 The Bank has identified three groups that it thinks may be affected by the issues raised in this consultation (see Section 7):
   a. Do you agree that these groups are likely to be affected? If not, please explain why?
   b. Do you think that there are other groups that might be affected? If so, please identify which groups and explain what the impact on such groups may be.

Q4 Can you provide any evidence of any potential equality impacts of using animal-derived additives or switching to additives derived from palm oil? If so, please provide details.

Responses should be submitted using the online form available at www.bankofengland.co.uk/polymerraditivesconsultation. The consultation closes at 23:00 BST on 12 May 2017. The views expressed in response will help inform the Bank’s decision on the future composition of polymer substrate that will be used for the new £20 polymer note and the future reprints of £5 and £10 polymer notes. The decision and a summary of responses to the consultation will be published in the summer.
2 The Bank’s responsibilities in note issuance

One of the Bank’s key public functions is the issuance of notes. The Bank has been issuing notes for more than 300 years, beginning shortly after it was established in 1694. Back then, private banks and goldsmiths also issued their own notes as receipts for deposits of gold. Since 1921, the Bank has been the sole issuer of notes in England and Wales.\(^{[1]}\)

The Bank’s overarching note issuance responsibility is to maintain confidence in the physical currency. The public should be confident that:

- they can get the quantity and denominations of notes they want when they want them;
- their notes are genuine; and
- the notes are good quality and can be easily authenticated.

The Bank meets these responsibilities through the design and manufacture of notes that are highly secure and recognisable to the public.

The Bank also seeks to achieve value for money so it is able to pass on greater income from note issuance to the taxpayer. A note that is sold at face value by the Bank to the wholesale sector is paid for via an electronic funds transfer to the Bank. The Bank invests the funds into an interest-bearing asset, such as a government bond. The Bank therefore receives interest income from the assets, yet pays no interest on the corresponding liability (the note). Once the costs of note production and issuance have been deducted from this income, the net income earned — referred to as ‘seigniorage’ — is passed on to HM Treasury. The value of seigniorage was £462 million in the year to 29 February 2016.\(^{[2]}\) Any increase in the cost of notes production reduces the transfer to HM Treasury and therefore is a cost to the taxpayer.

The Bank’s commitment to Corporate Social Responsibility (Box 1) underpins how it performs all of its functions. In the specific case of polymer notes, the Bank has taken steps to:

- educate the public about its notes;
- meet the needs of users who are blind or partially sighted;
- reduce the environmental footprint of its notes (see Section 3); and
- ensure notes are safe to use, including by children, by confirming that they comply with the British Standard for Toy Safety EN 71 and EU Regulation 1907/2006;\(^{[3]}\) and
- understand through this consultation paper the environmental and social impacts of the use of animal-derived or plant-derived additives in its notes.

To meet public demand for notes, the Bank works with the cash industry to distribute good quality notes in sufficient quantities. While the Bank forecasts the future amounts of new notes that are required and purchases them from its printer, De La Rue, distribution of these notes is undertaken by the cash industry. Since 2001, the activities to manage the circulation of these notes have taken place under the Note Circulation Scheme (NCS). There are currently four NCS members: G4S; Post Office; Royal Bank of Scotland; and Vaultex UK Limited. The Bank must also consider the needs of the wider cash industry through all stages of a note’s lifecycle, whether that is concerning secure transport between locations, eg to bank branches and to fill ATMs, or the ability of machines to authenticate and process notes. This is particularly important when transitioning to a new note. For example, updating all machines across the country to process the polymer £10 note requires 6–9 months lead time.

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\(^{[1]}\) Seven banks in Scotland and Northern Ireland are authorised to issue notes. Legislation is in place to ensure that holders of notes issued by the authorised banks receive a level of protection similar to that provided to holders of the Bank’s notes. The Bank regulates their compliance with this regime. For more information, see www.bankofengland.co.uk/banknotes/Pages/about/scottish_northernireland.aspx.

\(^{[2]}\) The equivalent figure for the year to 28 February 2017 is not yet available.

\(^{[3]}\) Regulation (EC) 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency.
Issuing new note designs is a critical aspect of maintaining the public’s confidence that notes that they receive are genuine. Counterfeits are worthless, so anyone who accepts one runs the risk of being out of pocket. The likelihood of an individual being passed a counterfeit is very low. In 2016, 347,000 counterfeits — simulating the Bank’s notes — were discovered and removed from circulation (Chart 1). This was equivalent to a tiny fraction of 1% of all of the Bank’s notes in circulation at the end of 2016.

Even though the volumes are currently low, it is vital to stay ahead of counterfeiters. The Bank’s comprehensive anti-counterfeiting strategy is based on five pillars:

i) developing and issuing new state-of-the-art counterfeit resilient notes. This was one of the primary reasons for moving from cotton-paper to polymer notes, as explained in Section 3;
ii) working with the cash industry so that only high-quality, authentic notes are issued and recirculated;
iii) an active education programme that works with businesses and the public to help people understand how to identify genuine notes;
iv) providing a framework for cash machine companies and those companies that own or operate ATMs so that they can test and prove that their equipment and processes meets minimum authentication standards; and
v) working closely with law enforcement agencies to disrupt counterfeiting operations.

To ensure public confidence in notes, the Bank needs to take account of all of these factors when introducing new notes.
3 The rationale for moving to polymer notes

Section 2 set out how the Bank meets its note issuance responsibility to maintain confidence in the physical currency. The Bank’s decision to move to a polymer substrate was driven by major benefits that directly support this: polymer notes when combined with strong security features are cleaner, safer and stronger as well as being more environmentally friendly than cotton-paper notes.

Cleaner

Polymer is impermeable and of a non-fibrous nature which means that it repels dirt and moisture. Consequently, polymer notes are cleaner than the cotton-paper equivalents that they replace. Coupled with the improved durability, polymer notes remain in good condition for longer and become less tatty.

Feedback over time from the public suggests they put a premium on clean, good-quality notes and consider the notes in their pocket as a source of national pride. Importantly, better quality notes also support counterfeit resilience — since it is harder to check security features on a tatty note.

Safer

The characteristics of polymer have been carefully crafted for notes so that it is difficult for a counterfeiter to source a similar material which feels the same and is easy to print on. In general, printing on polymer is more difficult than printing on cotton-paper and requires specialist equipment. When combined with leading-edge security features, such as transparent windows and features that look different from each side of the note (for example, the Elizabeth Tower on the polymer £5 note), polymer notes provide a step change in counterfeit resilience.

Over 30 countries issue polymer notes, including Australia, Canada, Fiji, Malaysia, Mexico, New Zealand, Nigeria, and Vietnam, as well as the Scottish issuing banks. All countries that have introduced polymer notes have reported a decline, often a significant one, in counterfeit levels, with very low residual volumes as a result. This has also been the Bank’s experience to date.

The current cotton-paper £20 note is the most heavily counterfeited Bank of England note, so the Bank does not wish to delay the issue of a new polymer £20 note beyond 2020.

Stronger

Polymer notes are stronger and more durable than their cotton-paper equivalents. The greater durability is due to the physical structure of the material, which makes it more resistant to damage such as tearing. This means that polymer notes last at least two and a half times longer than cotton-paper notes. While the initial cost of producing a polymer note is higher than for a cotton-paper one, fewer replacement notes need to be printed over the long term.

Greater durability also benefits the cash industry. Since tatty or damaged notes are often the cause of note machine jams (and therefore unavailability), better-quality notes should lead to greater efficiency in note processing.

Environmental impact

During its research into polymer notes, the Bank commissioned an independent study\(^1\) from PE International (now Thinkstep), which concluded that polymer notes have a lower environmental impact than their cotton-paper notes.

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\(^1\) LCA (life cycle analysis) of paper and polymer banknotes — Final study report, PE International, 2013. This and a subsequent study of management options for polymer waste from notes are available at www.bankofengland.co.uk/banknotes/polymer/Pages/factsheets.aspx.
equivalents. The study examined the life cycle of a note from the production of the raw material through the manufacturing, printing and distribution phases before being destroyed and the waste disposed. Polymer notes scored better than cotton-paper notes for all of the main phases of a note’s life cycle, and for six of the seven environmental indicators used. Polymer notes can be recycled, with the material used to make other products. Key points from the study are set out in Box 2.

The Bank also took a decision to reduce the size of the new series polymer notes (current Bank of England paper notes are large by international standards) by around 15%. Smaller notes meant less material would be used in their production, reducing manufacturing costs and delivering further environmental benefits.

**Box 2**

**The environmental credentials of polymer notes**

**The independent environmental impact assessment**

As part of its research reviewing the relative merits of printing notes on polymer compared with cotton-paper, and in line with its commitment to environmental sustainability, the Bank commissioned an independent comparative environmental impact study in 2013. The study was conducted by PE International (now Thinkstep), a sustainability consultancy firm, using the relevant international standards for Life Cycle Assessment, and externally reviewed by a panel of industry experts. It looked at all of the stages that a note encounters through its life: from first production of raw materials, manufacturing of the note materials, printing, distribution into circulation, recirculation (dispensing by ATMs, sorting at regional cash centres) and final return to the Bank for destruction and treatment of the waste. The study considered the impact of each stage of the note life cycle on seven environmental indicators, including global warming potential, water and energy usage, ozone creation and environmental toxicity.

**Benefits of polymer notes**

Polymer showed benefits over cotton-paper for all the main phases of its life cycle. For the majority (six from seven) of the indicators covered by the study, it was shown that polymer notes have a lower environmental impact than cotton-paper notes. **Chart 2** below presents a summary of the contribution of each part of the note life cycle to emissions of greenhouse gases. For the purposes of this study, polymer notes were conservatively judged to last 2.5 times longer than cotton-paper notes and this is the main factor leading to their strong

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**Chart 2  Contribution by life cycle stage to climate change (greenhouse gases emissions)**


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(1) Thinkstep has subsequently confirmed that replacing animal-derived additives would not affect the overall environmental benefits of polymer notes versus cotton-paper due to the small quantities involved.
environmental performance. This is mainly due to the reduced environmental burdens associated with raw material production and processing of new notes to replace unfit ones. Furthermore, the Bank has also been working closely with the Carbon Trust with the view to obtaining independent certification of the expected carbon reduction benefits of polymer notes compared with cotton-paper notes, using their product certification label in line with PAS 2050, which is an internationally recognised method for quantifying the carbon footprint of products.

Recycling polymer notes
Old paper notes are already recycled using a composting treatment (as used in the treatment of food waste). As composting is not suitable for polymer notes, the Bank commissioned an independent third party to conduct a Life Cycle Assessment study to assess the environmental impacts of different waste treatment options. This study was conducted using the relevant international standards and externally reviewed by a panel of industry experts. Recycling proved to be the most favourable option as it comes with the lowest impacts for all the environmental impact indicators considered. As a result, the Bank secured in 2016 a UK-based recycling solution for returned polymer notes.

Public engagement
Before deciding to issue its next £5 and £10 notes on polymer, the Bank conducted a public consultation programme between 10 September and 15 November 2013. The Bank also consulted with retailers, businesses and the cash industry. Bank staff attended nearly 50 events around the country, and the Bank commissioned independent focus groups and surveys. Nearly 13,000 people provided feedback with 87% of those responding in favour of polymer notes. 6% were opposed and 7% were neutral. Concerns regarding animal-derived additives were not raised in the consultation, although detail on the polymer substrate’s ingredients or production process did not feature heavily in the 2013 consultation process. The Bank only became aware that animal-derived additives were used in the production of polymer substrate late in 2016, and after it signed the contract with Innovia Security for the supply of the £5 and £10 substrate.

The Bank also worked with the Royal National Institute of Blind People (RNIB) to understand how polymer might impact on people who are blind or partially sighted. Focus groups conducted by the RNIB did not highlight any notable difficulties in using polymer notes. The Bank retained the tiered sizing of notes, bold colours and clear numerals all of which were highlighted as useful for identifying denominations. The Bank and RNIB designed bespoke communications, including for the RNIB website, public appearances, radio adverts and newsletters. Additionally, the Bank has worked closely with the RNIB in developing a tactile feature which will be included on the £10 and £20 polymer notes. Focus groups were used to determine the shape and location of the feature on the note. 91% of RNIB study participants stated they would utilise a tactile feature in some way.

Following the issue of the polymer £5 note in 2016, the Bank commissioned independent surveys focusing on the awareness and acceptance of the new note. The feedback indicated that the note was quickly accepted by members of the public, with many asking for the other denomination notes to be also printed on polymer. Only 5% were opposed to the switch to polymer notes. Participants welcomed the increased counterfeit resilience and commented that they preferred the new notes.

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[1] For more detail see the Bank’s Polymer public consultation programme factsheet, which is available at www.bankofengland.co.uk/banknotes/polymer/Documents/polymerconsultationreport.pdf

4 The note production process

This section summarises the note production process and explains its length and complexities.

Role of key suppliers and the supply chain

Bank of England notes are printed at the Bank’s printing works by the Bank’s contracted printer, De La Rue. The production of any note requires sophisticated components from multiple globally dispersed suppliers including the substrate, inks and security features such as holographic foils. Many of these are procured on the Bank’s behalf by De La Rue.

As is typical of many complex products, the components that create notes are themselves made from many other ingredients, often leading to supply chains consisting of multiple levels of suppliers. The subsequent tiered nature of the supply chain means that a large number of suppliers ultimately contribute to the production of a single note, but the majority of these are not direct suppliers to the Bank.

The major global producers of polymer substrate for note production are De La Rue and Innovia Security. For the supply of polymer for the £5 and £10 notes, the Bank entered into a contract with Innovia Security. The Bank has not yet confirmed who will supply £20 polymer — the tender has been put on hold until the Bank has decided, in light of this consultation and other factors, the appropriate composition of the polymer substrate. However, as producers of polymer substrate, the Bank has asked both De La Rue and Innovia Security to develop and trial polymer substrate that is produced using chemical additives that are ultimately derived from plant oil rather than animal sources. They are trialling palm oil: coconut oil was considered as an alternative but has been discounted (see Section 5).

Polymer note production

To meet the Bank’s requirements for a high quality note, with strong resilience against counterfeiting while remaining easy to authenticate, a note must combine intricate printed graphics with sophisticated materials and technologies, each of which is uniquely configured to meet the Bank’s specifications. This requires lengthy trialling and testing before commencing full production and, given the volume of notes the Bank requires, there are long manufacturing lead times.

The key steps in the note production process are set out below. The Bank works closely with De La Rue and as appropriate with other suppliers, in all of these steps.

<table>
<thead>
<tr>
<th>Indicative note production timeline</th>
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<tbody>
<tr>
<td><strong>DESIGN</strong></td>
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<td>0</td>
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<tr>
<td>The design process includes character selection, selection of security features, multiple design iterations, obtaining copyright approval and proof-printing. Duration = 2 years</td>
</tr>
</tbody>
</table>
Pre-production steps

Step 1: Design
The initial design process for Bank of England notes is complex: the public nomination process to select the character for the new £20 polymer note was launched in May 2015 and the design process is scheduled to conclude in Summer 2017 ahead of the first printing trial. Typically the design process includes character selection, selection of security features, multiple design iterations, obtaining copyright approval and proof-printing.

Step 2: Pre-production trials
Depending on the complexity of the note design and specification, 1–1.5 years of pre-production trials and design iteration will be necessary to optimise the design for the manufacturing equipment, industrial scale production and for circulation. During this process, the Bank receives feedback from its printer and key suppliers, which can trigger design modifications.

Additionally, sample polymer notes are distributed to key manufacturers of cash processing equipment (ATMs, self-check-out systems, etc). They provide feedback about the note design, the materials and whether design changes are needed for their systems to work effectively.

Following this trialling stage, the impact of changes to any critical components in the production process have to be understood fully by the Bank’s direct suppliers through a long and rigorous process, potentially involving extensive re-testing, given the interdependencies that can exist in the manufacturing process. This has implications for the speed with which the Bank can introduce changes to the way its polymer notes are produced, and therefore the Bank’s options regarding the ingredients used in the polymer substrate.

It is highly preferable that each industrial scale pre-production trial utilises the intended final production materials. Whether or not to use polymer substrate produced using animal-derived additives in the new £20 polymer note is therefore an urgent decision that must be taken in Summer 2017 ahead of planned pre-production trials. This decision needs to be made soon to keep the overall planned timeline of issuing a new polymer £20 by 2020 on track. The current cotton-paper £20 note is the most heavily counterfeited note. Therefore given the benefits of polymer notes set out in Section 3, in particular their counterfeit resilience, the Bank does not wish to delay the issue of a new polymer £20 note beyond 2020.

Production

Each of the following steps are undertaken by the Bank’s printer.

Step 3: Lithographic printing
This process transfers about 90% of the printed content of the note to the substrate.

Step 4: Surface application of non-printed security elements
Where materials, for example the foil Elizabeth Tower on the £5 polymer note, are applied to the surface of notes, this is undertaken with specialised application equipment.

Step 5: Intaglio printing
This process completes the front of the note by transferring the portrait of HM Queen and the main raised text elements.

Step 6: Numbering
Serial numbers are printed on the back of the notes. For the polymer £10 note and, in due course, the polymer £20, this process is simultaneously used to emboss a tactile feature.

Step 7: Varnishing
Both sides of the sheet are coated with a clear varnish that protects the printed elements from the effects of wear and tear, extending the life of the notes.
Step 8: Cutting
The sheets are cut to produce individual notes.

Step 9: Automatic inspection
Each note is passed at high speed through an automated inspection process that performs multiple checks for defects. Defective notes are out-sorted and destroyed; notes of the right quality are ready for issue.

Production timeline
The process of developing, producing and issuing any new note is lengthy and complicated. For Bank of England notes, it takes 3–3½ years to design and trial a note before starting full production. Typically, full production will commence 1–1½ years prior to issue in order to build-up sufficient stocks to meet the demand for the new notes. This is why the character selection for the £20 started in 2015, with a view to issuance by 2020.
5 The role of animal-derived additives in polymer note production and alternative options

The Bank is not directly involved in the production of the substrate, but purchases finished polymer substrate which has been coated in white ink (opacified). The two international producers of this substrate are De la Rue and Innovia Security.

The Bank was not aware that animal-derived additives were used in the production of polymer substrate when it signed the contract with Innovia Security for the supply of £5 and £10 substrate. In response to a public enquiry following the launch of the polymer £5 note, the Bank investigated whether animal-derived products were used in polymer banknotes and sought confirmation from its suppliers. Following investigation within their supply chains, only one of the Bank’s suppliers, Innovia Security, indicated that polymer pellets they sourced from other specialist companies contained extremely small amounts of animal-derived additives from tallow.(1)

The animal-derived additives (a type of oleochemical)(2) are derived from a class of chemicals called ‘fatty acids’ used in trace amounts by global manufacturers of polypropylene, a type of polymer that is used for a wide variety of everyday products. These chemical additives are among several added to aid the manufacturing process and properties of the final material (see Box 3). The uses of this polymer include toys, car parts, film packaging, detergent and toiletry bottles, clothes, furniture, washing machine parts and many other applications.(3) Polymer notes represent just one product of many that the public would come in contact with during a typical day that may have been manufactured using chemicals derived ultimately from animals.

The Bank understands that other countries who issue polymer notes were similarly not aware of the use of animal-derived additives in the production of the substrate until the Bank’s announcement on 30 November 2016.(4) Polymer notes were first issued in 1988. Today, over 30 countries have adopted polymer as the substrate for some or all of their notes. De La Rue and Innovia Security have both confirmed that trace quantities of animal-derived additives are included in the production of their polymer substrate. Therefore, wherever polymer notes circulate in the world, the production of the polymer substrate used trace quantities of animal-derived additives (see Box 4).

Alternative sources

A range of plant-based oils can be alternative sources to animal-derived additives, however they are not all suitable for the production of notes. In addition to the technical requirements, a viable alternative additive needs to have a reliable supply chain; to be available at reasonable cost; and, for certain sources with wider environmental considerations, the product may need to be obtainable under a well-developed sustainability certification framework (see Section 6).

The advice from De La Rue and Innovia Security is that an additive derived from palm oil would appear to be the only alternative that could potentially meet these requirements. This is consistent with advice received from Efeca. Palm oil is a good source of fatty acids. Whilst there are concerns about certain environmental and social impacts of palm oil, growing awareness of these has led to the development of a range of sustainability assurance systems, such as certification schemes, which could be adopted to mitigate potential impacts (see Section 6).

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(1) A rendered form of animal fat that is a by-product, mainly from livestock farming.
(2) Chemicals derived from plant and animal fat.
(3) www.bpf.co.uk/plastipedia/polymers/PP.aspx.
(4) www.bankofengland.co.uk/publications/Documents/other/polymerassessment.pdf.
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The Bank asked its suppliers to consider coconut oil. However, they judged that it would not meet the criteria at this time since supply chains are insufficiently mature and there is no generally-accepted sustainability certification framework in place. Products derived from coconut oil are not, therefore, being trialled.

Other potential plant sources are lower yielding, making them inefficient, or require chemical transformation (“hydrogenation”) to be usable and have been ruled out. In particular, soybean oil, rapeseed oil and sunflower oil are too low in their content of saturated fat — and therefore fatty acids — to make them viable commercial sources.

Polymer notes are the product of multiple, interdependent materials. Because of the complexity of the note production process and the key role that the polymer substrate performs as the platform for all of the additional components and security features, the Bank and its suppliers must be very confident that the substrate can be provided consistently to the technical specification required without affecting the production process or functionality of the note. Given this, extensive testing and trials of polymer chemical additives derived from palm oil must be undertaken. These tests are underway and are expected to complete in Summer 2017. De La Rue and Innova Security have a high degree of confidence that a substrate manufactured from polymer that utilises such an additive can meet the Bank’s technical and operational requirements.

Sustainability considerations
Not only do the Bank and its suppliers need to be confident that a substrate manufactured using an alternative additive meets its technical specification, but also as to the feasibility and cost of sourcing polymer produced using an alternative plant-based additive on an on-going basis.

If the Bank chooses to adopt a polymer substrate produced using a palm oil-derived additive, it may require its suppliers to conform to an agreed sustainability certification standard to mitigate associated environmental and social impacts (see Section 6). The Bank recognises that the quantity of polymer required for the Bank’s polymer notes is a tiny fraction of the global production. It would therefore not be practical for the Bank to set requirements on its suppliers on sourcing or sustainability standards that differ from those commercially available or generally adopted. De La Rue and Innova Security advised the Bank that they will need to understand the impact of compliance with that standard. They might, for example, need to source certified and sustainably produced palm oil from established providers; adopt the requirements that come with certification; and adapt

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**Box 3**

The polymer supply chain for notes

Bank of England notes are made from a polymer called polypropylene. This is a bulk industrial product and many millions of tonnes are produced every year by global chemical companies. Polypropylene is used to make toys, packaging, plastic bottles for household use (eg shampoo and cleaning products), car parts, clothes, furniture and parts for washing machines and other ‘white goods’. At a high level, the steps to making polymer notes are:

1. Polypropylene pellets are manufactured through a chemical process known as ‘polymerisation’. The core material is propylene (C₃H₆), a hydrocarbon compound generally derived from petrochemicals. During this process, various chemical additives are used to aid the manufacturing process and modify the final properties of the product. These chemical additives are themselves typically made and supplied by specialist chemical companies. Some of these additives are oleochemicals and may be sourced from tallow or potentially from vegetable oils, such as palm oil.
2. The polypropylene pellets are then used by specialist manufacturing companies. They are melted under pressure and then extruded to make transparent polymer film. Polymer film is used for a wide variety of purposes eg product wrapping, of which note production is a very small fraction.
3. For notes, the polymer film is then coated with white inks (‘opacified’) to make the polymer substrate which forms the base for printing the notes. Innova Security and De La Rue are the key suppliers of polymer substrate globally and are the suppliers the Bank would directly contract with in this supply chain.
4. The notes are then printed on this polymer substrate at the Bank’s printing works by De La Rue.
Box 4
Level of usage

Whilst recognising the ethical and religious considerations arising from any use of animal-derived additives in the production of polymer substrate may be independent of the quantity used, the comparative data on sourcing volumes are informative.

The animal-derived additives used in the production of polymer substrate are only used in trace amounts. Notwithstanding the high volume of notes required, the quantity of oleochemical additives required for substrate production is small in absolute terms and tiny compared with global production, whether sourced from animals or plants.

These can be estimated from the anticipated production volume of the polymer £20 note, the estimated quantity of fatty acid-derived compounds in the production of each note and the estimated efficiency in the production of these compounds from tallow and palm oil respectively.

Based upon the estimates of fatty acid-derived compounds used in the manufacture of the £20 note, the Bank estimates that consumption of fatty acid derivatives required for production of the £20 over ten years (including the launch stock) would equate to the usage of tallow by-products from around 25–30 cattle.

The same quantity of fatty acid-derived compounds from palm oil could be sourced from one year’s production of less than 6 hectares of palm oil plantation, compared with around 12 million hectares of palm in plantation in Malaysia and Indonesia alone at 2013.

established systems and bulk manufacturing infrastructures to output a potentially small quantity of specialist-grade product (free from any contamination with animal derived material). The choice of environmental standard may therefore impact on production costs.

De La Rue and Innovia Security are working with their own supply chains to identify the availability of palm oil products that can be verified as sustainably produced and the viability of using these in their processes. They will need a mature supply chain and be available at reasonable cost. Both suppliers would aim, subject to technical and commercial feasibility, to target mass balance certification, under the RSPO framework, towards the start of production of the £20 polymer note.

Commercial considerations

Substrate suppliers need to take into account commercial factors, including the needs and preferences of other note issuers. The commercial impact may, in part, depend upon whether they need to manufacture the substrate using an alternative additive for all of their customers globally. That may depend on the desire of other central banks to adopt the alternative, which may require testing and trialling equivalent to that which the Bank is undertaking. The Bank understands that the presence of animal-derived additives in polymer notes has received less attention in other countries.

The Bank seeks to achieve value for money in its production of notes and must take account of any cost impact of switching to a substrate produced using an alternative additive. Despite the complexity of the process outlined above and the advanced and sophisticated materials and technologies utilised, the cost of producing each individual note is just a few pence. However, the volume of notes required to meet demand means that overall costs are significant.

A change to additives derived from palm oil may result in an increase in the cost of the polymer substrate. And the level of increase may depend on any agreed sustainability standard. The Bank’s suppliers are still undertaking trials and investigating supply chain options so a final position on costs has yet to be reached. This coupled with the fact that the Bank is still finalising the £20 design and security features, and hence the cost of the note, and

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(1) The Bank expects to print around 5 billion polymer £20 notes over the ten years including launch stock.
(2) The polymer £20 note will be around 25% larger than the polymer £5.
(3) A hectare is 100m x 100m. It is approximately the size of a rugby pitch.
(4) Vijay, V, Pimm, S, Jenkins, C and Smith, S (2016), The impacts of oil palm on recent deforestation and biodiversity loss.
the difficulty in forecasting long-term demand for notes, means at this stage the Bank cannot provide precise
details of the impact on cost of moving to palm oil. A reasonable assumption for the cost of printing £20 polymer
notes over the next ten years is £300 million. Based on very indicative costs from suppliers, the increase in costs
from moving to palm oil could be broadly in the region of £5 million over the next ten years for £20 polymer note
printing.
The future composition of polymer banknotes — a consultation paper

March 2017

The Bank’s decision to move from cotton-paper to polymer has already delivered a reduction in the environmental impact of note issuance (see Box 2, Section 3), and the Bank is committed to sustaining this going forward.

To inform this consultation, the Bank has sought to understand further the environmental and social impacts associated with the use of both animal derivatives and a potential plant-based alternative in the substrate. The Bank spoke with representatives of the NGO Forest Coalition, the Global Canopy Programme and WWF and also sought independent expertise from Efeca, an environmental consultancy. Efeca’s Report was based on a desk-based review of available evidence, supplemented by interviews with industry experts. This section draws on Efeca’s findings as presented in their full Report, which is published alongside this consultation paper.

While a palm oil derived additive would now appear to be the only alternative that could potentially meet the technical and commercial requirements for polymer substrate (Section 5), the Bank also sought to understand the impacts associated with coconut oil production. The Bank requested that the study of environmental and social impacts focused on the chemical additives, that could potentially be used in the production of polymer, that are derived from tallow, palm oil and coconut oil. The Bank has established that the volumes required to produce the derivatives required for the production of polymer notes are very small (Box 4, Section 5). As a result, they would not act as a meaningful driver for additional production, so this section and Efeca’s Report focus on the generic impacts of tallow, palm oil and coconut oil, rather than the direct impact arising from their use in the Bank’s notes.

Environmental and social impacts associated with derivatives sourced from tallow, coconut oil and palm oil

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Environmental and social impacts associated with tallow

Although the concerns raised so far have, in the main, been religious and ethical rather than environmental and social, it is important to consider all impacts in order to inform fully the comparison. Tallow is a by-product and so its environmental and social impacts are related to those of the livestock and meat processing industries.

Most tallow is mainly used in its country of origin and only about a sixth of global production is exported, with Australia, the United States and New Zealand being the top exporters by volume. From a global perspective, livestock production is highly resource-intensive in terms of water, land and energy use. It is estimated that the livestock sector contributes to 14.5% of global greenhouse gas emissions. Livestock production is also associated with high levels of deforestation, the use of forced labour and conflicts with indigenous peoples in Brazil and some other South American countries; however, none of these countries are major exporters of tallow. The more likely source of the tallow used to derive additives for use in the production process for the Bank’s future polymer notes is more local, probably at the European level. While livestock production in Europe is not associated with deforestation, it still drives the consumption of significant volumes of land, agro-chemicals, energy and water.

A very limited number of initiatives are in place to support the sourcing of tallow from sustainable sources; these tend to focus on tallow for use in energy generation (eg biodiesel). One area for consideration is tallow sourced from organic certified animals. However, the ultimate source of tallow that is used to derive the chemical

additives used in the production process for polymer notes is many steps removed from the Bank’s existing polymer substrate supplier, making it extremely challenging for the Bank to seek organic or similar standards from its supply chain.

Environmental and social impacts associated with coconut oil
The production of coconut oil, which is made from the edible white flesh of coconuts, has been increasing in the last decade driven by a diverse range of applications such as foods, cosmetic products, and biofuels. Efeca’s Report states that 3 million tonnes of coconut oil was produced in 2015, compared to 61 million tonnes of palm oil. A 2016 report by WWF Deutschland noted that coconut has a relatively low yield at 0.7 tonnes per hectare compared to palm oil yield of 3.3 tonnes per hectare, meaning it requires more land to produce the same volume of oil.[1]

Coconut palms are grown mostly by smallholders, who are vulnerable to low living wages, crop failure from pests, disease or natural disaster, and ageing and lower yielding trees. On plantations, the prevalent practice of mono-cropping tends to result in environmental degradation and an increased risk of pests and diseases. Coconut palms are often grown on coastal sandy soils which are generally not suitable for other crops; coconut oil production is therefore not currently a leading driver of deforestation or a significant source of greenhouse gas emissions.

There is no specific certification standard for coconut production. In common with many other agricultural products, coconut products can be certified as organic or Fairtrade or to the Sustainable Agriculture Network standards applied by the Rainforest Alliance. However, Efeca did not identify any coconut oil-based certified sustainable derivatives.

Environmental and social impacts associated with palm oil
Due to its unique properties, high versatility and high production yields, palm oil has become the world’s most commonly used vegetable oil. Palm oil is used for a very diverse range of applications such as processed foods, cosmetics, detergents and many industrial applications, as well as being used as cooking oil and a source of biodiesel. Global demand for palm oil has seen strong and sustained growth, with production and exports more than doubling between 2000 and 2014. Given population growth, increasing urbanisation and rising incomes, which are associated with a dietary shift towards processed foods, future production is likely to increase. While most palm oil is produced in Indonesia and Malaysia, the largest source of the United Kingdom’s imports is currently Papua New Guinea.

As highlighted in Efeca’s full Report, palm oil was the fourth highest agricultural product in terms of impact on global deforestation, accounting for 8% of the global deforestation taking place between 1990 and 2008. Some of the forest may have been converted to palm oil production illegally. Associated environmental impacts include increased emissions of greenhouse gases (and the loss of long-term carbon storage[2] resulting from deforestation), soil erosion (particularly of peatland, which can result in fires, smog and high levels of greenhouse gas emissions), biodiversity and habitat loss, and land and water pollution.

One reason for the success of palm oil as an industrial crop is the fact that it is the highest yielding oilseed crop in the world per area of land: its average yield is seven to eight times that of soy, for example. In 2015, palm oil and palm kernel oil comprised 38.7% of global vegetable oil production from 6.6% of all the cultivated land used for vegetable oils. Its high rate of return coupled with the fact that its production often relies on smallholders has led to it playing an important role in economic development and rural livelihoods. However, the substantial increase in demand for palm oil, coupled with a slow rate of increase in yield, has meant that most of the expansion in global production has resulted from an increase in planting, often at the expense of forests.

The 2016 report by WWF Deutschland concluded that the one-to-one substitution of palm oil with other tropical plant oils, such as coconut oil, would not bring environmental benefits. It explained that soya and coconut oil grow in similar or ecologically similarly sensitive regions, and therefore the replacement of one oil for another would only shift environmental impacts elsewhere and could even exacerbate it because more land would be required, more greenhouse gas emissions would be generated, and more species would be endangered.

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[1] Palm oil report Germany — Searching for alternatives, WWF Deutschland 2016. WWF figures were based on data from FAPRI (2014) and FAO (2015; 2012).
[2] The ability of living plants or dead plant materials (eg peat bog) to accumulate and store carbon containing compounds for an indefinite period and thus prevent release into the atmosphere as carbon dioxide.
Social impacts vary. While palm smallholders exhibit the lowest incidence of poverty of all agricultural sub-sectors, plantation workers are often hired on a temporary basis and can suffer from low wages and poor conditions of employment and health and safety. There is also evidence of the use of forced labour and child labour in some areas. A further common problem is the infringement of the land rights of forest communities, particularly those of indigenous peoples, often because of a lack of recognition of customary rights. Ensuring the free prior and informed consent of the communities concerned is increasingly recognised as a requirement of sustainable palm oil production, alongside minimising its environmental impacts.

Levels of sustainability assurance for palm oil
Growing awareness of the environmental and social impacts of palm oil has led to the development of a complex range of sustainability assurance systems, such as certification schemes. Efeca has informed the Bank of the strengths and weaknesses of these different options.

The main palm oil certification scheme is that of the Roundtable on Sustainable Palm Oil (RSPO). A multi-stakeholder initiative, RSPO-certified palm oil now accounts for an estimated 17% of the global market. Key strengths, as well as its established and clearly differentiated scale of standards, include its work with farm smallholders and its supply chain traceability systems. However, the scheme is reported by Efeca to have attracted some criticism both for weaknesses in its principles and criteria and for failures of enforcement.

The Palm Oil Innovation Group (POIG), the High Carbon Stock Approach (HCSA) and the development of the RSPO Next standard are all responses to these perceived weaknesses in the RSPO system, and offer opportunities for companies to adopt higher standards for palm oil production.

Table 1 overleaf provides a high-level summary of the main sustainability standards available for sourcing palm oil. The table is based on Efeca’s Report and a more comprehensive overview of the different standards can be found in Annex 1 of their Report.

If the Bank’s suppliers were to switch their source of polymer to one that is made with palm oil derivatives, an important consideration would be the level of sustainability standards they could achieve. The small volumes of palm oil that would be used in the notes supply chain are highly unlikely to be a meaningful driver of direct environmental and social impacts. However, regardless of the quantities of palm oil which may be involved, the Bank wants to ensure that its practices are aligned to the UK Government’s commitments to sustainable palm oil (see Efeca’s full Report). The Bank is also aware that a number of private and public sector organisations have adopted varied commitments when it comes to sourcing palm oil, and is keen to follow industry good practice as far as is practical.

Any approach would need to be developed in close partnership with its substrate suppliers, to ensure the availability of substrate is not compromised. While the Bank seeks to achieve the highest practicable certification standards, there are a number of constraints it needs to understand. Derivatives are a sub-set of the overall palm oil market and the Bank understands that the full range of certification standards is not necessarily available for palm oil derivatives. This particularly applies to more advanced standards, such as those involving segregated supply of palm oil. Another important consideration will be the speed at which the Bank’s suppliers can mobilise their supply chain to adopt a specified standard. It may be that the approach is staged, with an immediate solution based on readily available sustainability standards such as RSPO supply models Book and Claim or Mass Balance, with a view to specify more stringent standards for the medium and long term, effectively defining a roadmap for sustainable sourcing in partnership with the Bank’s supply chain.

From the outreach discussions the Bank conducted with groups such as the WWF, the Bank received positive feedback for its early recognition of the sustainability impacts associated with palm oil and the use of environmental experts to inform its thinking. Consequently, and should the Bank’s suppliers move to polymer using additives derived from palm oil as an alternative to tallow, this consultation seeks the public’s views on the importance of the type of sustainability certification standard that could be achieved by those suppliers.
The future composition of polymer banknotes — a consultation paper March 2017

<table>
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<tr>
<th>Initiative</th>
<th>Brief description</th>
<th>Identified strengths and weaknesses</th>
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<tr>
<td>Roundtable on Sustainable Palm Oil (RSPO)</td>
<td>A third-party verified palm oil certification system, with three main options: <em>Full segregation</em> Allows the sourcing of Certified Sustainable Palm Oil (CSPO) traceable back through the supply chain to individual sources (palm oil from a single identifiable certified source can be described as Identity Preserved). <em>Mass balance</em> Allows for mixing of CSPO and non-CSPO certified palm oil in the supply chain provided that overall quantities at site levels are controlled. <em>Book and claim</em> Certificate trading scheme, with certificates purchased to cover the quantity of palm oil used, although the physical palm oil actually sourced may not be from CSPO.</td>
<td>The RSPO is the most widely recognised standard, with well-documented and developed governance processes in place. Its extensive uptake means that RSPO Certified Sustainable Palm Oil (CSPO) can be fairly readily obtained. As well as its scale, strengths include its smallholder programme, which drives improvement in livelihoods for some of the world’s poorest farmers, and its supply chain traceability systems, which can be used to trace derivatives back to the mill. RSPO has attracted criticisms, particularly for its perceived failure to effectively prevent deforestation caused by expansion of palm oil production and related impacts and to protect the rights of workers and forest communities. However, RSPO has a clear strategy of continual improvement through regular standard reviews and has an opportunity to address concerns by harnessing the improvements to implementation that new and evolving initiatives such as RSPO Next, POIG and the HCSA present.</td>
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<td>RSPO Next</td>
<td>Designed by RSPO as a voluntary standard for RSPO members, adding a number of additional criteria to the basic RSPO criteria, covering planters’ practices, such as avoidance of deforestation.</td>
<td>While a clear response to the weaknesses of the RSPO’s basic standard, RSPO Next is perceived by some groups as weaker than POIG (see below). Furthermore, this is a very new (and, for RSPO members, voluntary) standard and no palm oil production has yet been certified under RSPO Next.</td>
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<td>Palm Oil Innovation Group (POIG)</td>
<td>Led by a group of NGOs and ‘progressive’ palm oil producers, POIG launched as a response to the perceived weaknesses of RSPO, and seeks to decouple palm oil production from deforestation and other human rights and labour issues. It incorporates the HCSA (see below) as the best methodology for addressing deforestation and requires peatland restoration. It also has strong environmental requirements as well as detailed human rights and labour requirements.</td>
<td>POIG has developed innovative approaches to address the challenges of sustainable palm oil. However, the initiative is only now moving beyond pilots, it has only verified a small area of palm oil production and availability is limited. Governance processes are not as well-established as those of RSPO. Efeca’s assessment is that if POIG outputs were harnessed by RSPO, this would present a long-term opportunity for addressing deforestation and related environmental and social impacts as well as protecting workers’ rights.</td>
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<tr>
<td>High Carbon Stock Approach (HCSA)</td>
<td>Aims to identify and protect forests with high stocks of carbon. HCSA has developed science-based approaches and a methodology to avoid deforestation in critical areas.</td>
<td>HCSA addresses a common criticism of the RSPO standard: it more carefully identifies areas of land suitable for plantation development and high carbon stock areas which should be protected in the long term. However, it is not designed to address concerns regarding human and labour rights which it aims to support through collaboration with other initiatives. Its uptake is likely to be dependent on its adoption in the RSPO standards. Similarly to POIG, governance processes are not as well established as those of RSPO. If the HCSA is harnessed by RSPO, it presents a significant opportunity to help address deforestation caused by palm oil.</td>
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7 Equality considerations

The Public Sector Equality Duty in the Equality Act 2010 (EA 2010)(1) requires the Bank to have ‘due regard’ to the following objectives when discharging its public functions:

• the need to eliminate discrimination, harassment, victimisation and any other conduct that is prohibited by or under the EA 2010;
• the need to advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it; and
• the need to foster good relations between persons who share a relevant protected characteristic and persons who do not share it.

One of the purposes of this public consultation is to help the Bank identify and assess the likely impacts of a decision on the future content of polymer substrate on persons who share protected characteristics. The protected characteristics are: age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex and sexual orientation. The Bank seeks views from the public on the impact of the options that it is considering on groups who share those characteristics. It will take account of these views in coming to its decision.

While recognising that some individuals may fall within more than one group, the Bank has identified three potential groups that may be affected by the use of animal-derived additives and/or plant-based alternatives, in practice those ultimately derived from palm oil, in the production of polymer substrate:

• ethical vegans and vegetarians who are opposed to any consumption of, or contact with, products that exploit or cause harm to animals;
• certain religious groups for which veganism is part of their belief or where their belief includes the avoidance of violence to animals and/or the consumption or use of specific animal groups; and
• individuals with concerns over the impact that the use of either plant-based and/or animal-derived additives may have on the environment.

In order to help it identify and assess the potential impacts of the use of animal-derived additives and/or plant-based alternatives, the Bank has spoken with representatives of a number of groups. These include: the Global Canopy Programme, the Hindu Council UK, the Institute of Jainology, the Islamic Society of Britain, the Jain Network, the National Council of Hindu Temples, the NGO Forest Coalition, the Sikh Council UK, the Vegan Society, the Vegetarian Society and WWF.

*Chart 3* overleaf shows, the proportion of the United Kingdom’s population identifying themselves as being affiliated with each of the religious and ethical communities that the Bank met with, or is aware of a public statement from, at the time of the 2011 Census.

The key issues identified by the representatives of the groups in the meetings with the Bank are set out below.

### The Hindu community

The Bank met with representatives from the Hindu Council UK. They highlighted that some Hindus are concerned about the use of animal-derived additives in the production process for polymer notes, because one of the key virtues in the Hindu faith is Ahimsa, which is the practice of non-violence; including protecting animals, which symbolise many of the faith’s most important deities. Hindus attach a special status to the cow, as it represents life and the sustenance of life.

In order to maintain the purity of temples, bringing in meat is forbidden. A section of the community views animal additives in the production of polymer substrate as an equivalent issue, so some temples in the
United Kingdom have deterred the use of the new polymer £5 note in donations and offerings to deities within the sanctuary of the temple environment. Some such temples have seen a large decrease in donations as a consequence. Some members of the community also feel they should not handle the notes outside of temples. Notes are a key aspect of weddings and gifts to children in the Hindu faith.

The Bank also met with a representative from the National Council of Hindu Temples.

**The Jain community**

Representatives of the Jain Network and the Institute of Jainology explained that a fundamental value of Jainism is a belief in total non-violence. The use of animal-derived additives in the production process for polymer substrate, therefore, conflicts with this principle. The relative amount of animal-derived additives used is somewhat important for Jains since it will inform views on the relative amount of violence that has been caused, although this is based on the assumption that there is a viable and non-violent alternative. Consequently, some concerns have been raised within the Jain community about the handling of polymer notes, particularly by those attending temples and wishing to make donations.

**The Sikh community**

Representatives from the Sikh Council UK explained that a concern for members of the Sikh community focuses around the presence of an item whose production process has involved animal derivatives being brought within Gurdwaras (Sikh places of worship). Many Sikhs do not consume meat, fish or eggs for spiritual reasons. Individual Sikhs can choose whether or not to do so but these products should not be taken into Gurdwaras due to accepted traditions. A section of the community takes the view that polymer notes should be placed in this prohibited position. Consequently donations made during Gurdwara visits (an important aspect of the Sikh community) may be impacted. The Sikh Council noted that there is no real consensus on this issue within the community and no attempt has been made thus far to achieve one. However, on the assumption that alternative options are available, the Sikh Council regards the use of animal derivatives in notes as being unnecessary.

**The Muslim community**

The Islamic Society of Britain explained that there were no theological concerns for Muslims around the use of animal derivatives in the production of notes.

**The Vegan community**

The Bank met with representatives of the Vegan Society and a small number of other individuals on behalf of the vegan community. They explained that many of those following a vegan diet for ethical reasons sought to avoid animal products more widely, as far as was practicable. The Vegan Society estimated that c.1% of the UK population were vegans: more than half for ethical reasons.
The representatives of the Vegan Society felt that the strength of view over polymer notes had been higher than for other products containing, or being produced using, animal derivatives due to the perceived lack of choice. Some vegans asked for other notes or coin rather than accept polymer notes, while some vegan retailers felt unable to accept the notes, which could cost them business. It was noted that vegans in jobs that require regular contact with polymer notes could also be placed in a difficult position.

However, the Bank’s contacts also considered that the use of some other plant-derived additives, including palm oil, in the manufacture of polymer notes would be a concern for some vegans due to harm to wildlife and for environmental reasons.

**The Vegetarian community**
The Society’s surveys suggest that 74% of vegetarians choose that lifestyle for ethical reasons. The vegetarian community (including ethical vegans) was concerned about the use of animal-derived additives in the production process for polymer notes because of the harm to animals it entailed. While few vegetarians were completely refusing to handle the new polymer £5 note, the Vegetarian Society considered the strength of feeling amongst the community on this issue was higher than it has been for other products containing animal derivatives due to the perceived lack of choice. A Vegetarian Society survey found that nearly 30% of its members wanted the notes recalled, and 66% wanted all new notes to be made without animal-derived additives but not to recall the current polymer £5 note.

**WWF**
WWF highlighted that because the palm oil crop is the most efficient source of vegetable oils, it could be the least environmentally damaging source when produced sustainably. However, non-sustainable production of palm oil (and other vegetable-based oil crops) can lead to destruction of forests, with significant negative impacts on wildlife, as well as on the local indigenous human populations. Consequently, one of WWF’s strategic priorities is to work with different stakeholders on a number of initiatives to shift the palm oil industry to produce and source deforestation-free and fully sustainable palm oil and its derivative products.

WWF explained that the types of animal farming which could be a source of tallow could also result in deforestation, when sourced from countries such as Brazil, a high producer of beef livestock. However, they highlighted that in countries where such farming is managed in a sustainable manner, tallow is a by-product of such farming so its additional environmental impact can be negligible.

**The Jewish community**
Separately, the Board of Deputies of British Jews issued a statement saying that ‘The five pound notes wouldn’t cause any problem to Jews… Jews are not allowed to consume tallow but are permitted to handle it’. (1)

**Summary**
Based upon this targeted engagement and Efeca’s Report, the Bank has identified some negative effects which could potentially be experienced by members of the above groups in their use of polymer notes. In particular, there may be:

- a possible conflict with those philosophical beliefs which makes a person opposed to any consumption of, or contact with, products that exploit or cause harm to animals;
- difficulties for certain religious groups where their belief includes the avoidance of violence to animals and/or the consumption or use of specific animal groups; and
- difficulties for individuals with environmental beliefs to the extent that any plant-based and/or animal-derived additives used in the production of polymer substrate raise environmental sustainability issues.

In relation to all of the religious groups with which the Bank met, while recognising that the use of palm oil as an alternative source to animal-derived additives in the production of polymer substrate may have environmental consequences, no representatives considered there were any religious grounds for that concern.

The Bank is also keen to use this consultation exercise to learn whether other groups might be affected.

(1) Source: BBC website, 29 November 2017.
8 Consultation questions and how to submit a response

Through responses to its consultation, the Bank wishes to gain a better understanding of the views of members of the public on the use of animal-derived additives in polymer substrate, the alternative use of palm oil additives and whether any of the issues discussed in this consultation paper have an impact on the aims set out in the Public Sector Equality Duty in the Equality Act 2010.[1] The Bank will use the responses to help to weigh up the key factors before coming to a decision about the future composition of polymer notes.

These factors include:
• the Bank’s responsibilities in note issuance;
• the technical requirements of the polymer substrate used in future notes;
• the Bank’s obligations under the Equality Act 2010;
• the impact of any changes on firms that process and handle cash;
• the potential impact on the Bank’s suppliers;
• value for money for the taxpayer.

Consultation questions

Taking into account the information presented in this consultation paper, the Bank invites views on the following questions:

Q1 Do you have a view on the use of animal-derived additives in the production of polymer substrate? If so,
   a. What is your view?
   b. Please explain why.

Q2 Do you have a view on whether the Bank’s suppliers should move to using additives derived from palm oil as an alternative to animal-derived additives? If so,
   a. What is your view?
   b. Please explain why.
   c. Is your view dependent on whether the Bank’s suppliers use sustainable palm oil? If so, is your view dependent on the type of sustainability certification standard that could be achieved by the suppliers (see Section 6 for an explanation of these)?

Q3 The Bank has identified three groups that it thinks may be affected by the issues raised in this consultation (see Section 7):
   a. Do you agree that these groups are likely to be affected? If not, please explain why?
   b. Do you think that there are other groups that might be affected? If so, please identify which groups and explain what the impact on such groups may be.

Q4 Can you provide any evidence of any potential equality impacts of using animal-derived additives or switching to additives derived from palm oil? If so, please provide details.

[1] Section 149.
How to respond to this consultation

Responses should be submitted using the online form available at www.bankofengland.co.uk/polymeradditivesconsultation.

This consultation will close at 23:00 BST on 12 May 2017.

The Bank will review consultation submissions, alongside the advice from suppliers and third party experts on alternative options, the viability of the supply chains, cost and operational considerations for steady-state production. The Bank will also take into account the other key considerations set out in this paper, before issuing a response in the summer.

Those who are not able to use the online form can send written responses to the following address:
Polymer Additives Consultation
Notes Directorate
Bank of England
Threadneedle Street
London
EC2R 8AH

Any other queries about this consultation, or requests for a large print copy of this consultation paper, should be sent to polymeradditivesconsultation@bankofengland.co.uk. A Welsh translation of the consultation paper will be made available online at www.bankofengland.co.uk/polymeradditivesconsultation.

The Bank reserves the right to publish any information which it may receive as part of this consultation. Information provided in response to this consultation, including personal information, may be subject to publication or release to other parties or to disclosure, in accordance with access to information regimes, including under the Freedom of Information Act 2000 or the Data Protection Act 1998 or otherwise as required by law or in discharge of the Bank’s statutory functions.

Please indicate if you regard all, or some of, the information you provide as confidential. If the Bank receives a request for disclosure of this information, the Bank will take your indication(s) into account, but cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system on emails will not, of itself, be regarded as binding on the Bank.