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BRITISH COATINGS FEDERATION

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A Resource Efficiency Action Plan for Decorative Paint

Creating a circular economy for leftover decorative paint in the UK





Published by the British Coatings Federation, March 2015

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www.coatings.org.uk

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The British Coatings Federation

The British Coatings Federation (BCF) is the sole UK Trade Association representing the interests of the decorative, industrial and powder coatings, printing inks and wallcovering industries. Founded in 1912 as The National Federation of Associated Paint, Colour and Varnish Manufacturers of the United Kingdom, the BCF has 125 manufacturing members representing more than 90% of the UK paint and coatings market, and 50 associate members (suppliers to the industry). Manufacturers come from a wide range of small- and medium- sized enterprises as well as large multi-nationals, with the greatest concentration of member companies based in the North-West of England.

The Coatings Industry supplies the construction, home improvement, printing, automotive, aerospace and other advanced manufacturing sectors worth over £188 billion to UK plc. 300,000 people are directly involved in manufacturing, applying or using coatings. Three out of every four cans of paint sold in the UK are made in the UK, and 30% of UK production is exported, making the UK a net exporter of paint. Three in five paint companies export, which is well above the average of one in five UK companies at present.

BCF members who manufacture decorative paint

Executive Summary

Every time I meet someone and raise the issue of dealing with leftover paint, it seems to hit a nerve. Research has shown that the average household has 17 cans of paint in their shed, garage or under-stairs cupboard, and most people I meet think they have got more than that. That could be as much as 450m litres of paint across 26.4m households! But what do you do when you want to dispose of it? Only 10% of Household Waste Recycling Centres (HWRC) currently work alongside a re-use or remanufacturing programme, and only 40% accept paint as a separated / collected material. For most of the UK public, it means disposing in black refuse sacks and it going to landfill, pouring the water-based paints down your sink (not recommended by manufacturers or the Environment Agency) or mixing it with soil or something to make it "solid" to put into landfill. The majority of liquid paint returned to HWRCs is incinerated, as the landfilling of liquids is banned, costing local authorities millions of pounds.

Only 2% of the 50m litres of leftover paint created each year are reused or remanufactured, yet it is technically feasible to turn around 40% of this waste back into new paint. Creating a circular economy for leftover decorative paint is possible, but it won't happen without a sustainable funding model and joined up thinking from the paint industry, retailers, the waste industry and local / national government to reach a win-win situation.

It is important to remember the general context against which our initiative will sit. All the leaders of the 3 main political parties have recently affirmed that "the environment" will not be an area of cross party division or argument in the UK. Green Alliance recently released a report identifying tens of thousands of new jobs in the circular economy. The respected Aldersgate Group of leading UK Blue chip companies are calling for an Office of Resource Management in Whitehall and the Ellen MacArthur Foundation, with the Royal Society of Arts, is driving Project Main Stream (in conjunction with McKinsey). All these initiatives reflect growing and widespread understanding that wasted resources are both a threat and an opportunity for all supply chains in tomorrow's world.

This Resource Efficiency Action Plan (REAP) outlines the history and the challenges to recycling waste paint, and points towards some of the potential solutions. We hope that this will lead to the creation of a framework for a national scheme to handle leftover decorative paint, that all stakeholders will be proud to be a part of.

We will start on this journey by launching PaintCare, our vehicle for a voluntary commitment to solving the problem. So, to the stakeholders listed within this document, I would like to welcome you to our project, and hope that you are ready and willing to join this effort to solve the issue of leftover decorative paint in the UK.

Tom Bowtell, CEO of the British Coatings Federation

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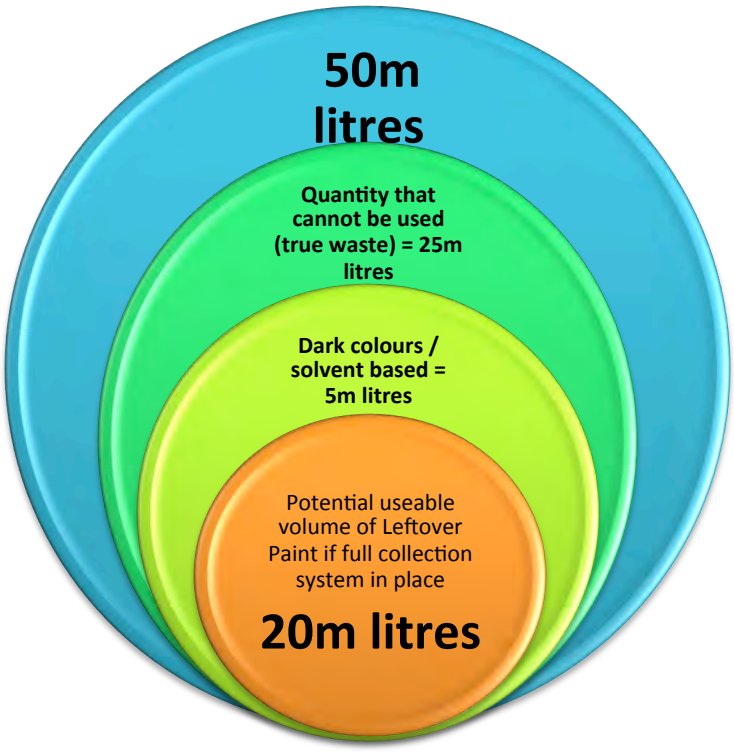
1. Introduction

Every year fifty million litres of leftover paint are estimated to be potentially available to enter the UK waste infrastructure, although only about 50% of this volume actually reaches the Household Waste Recycling Centres (HWRCs) or is disposed of through kerbside collection (in the wheelie bins, as domestic waste). Most leftover decorative paint (> 95%) in the waste stream is currently being sent for incineration or ending up as landfill. There are also significant quantities of leftover paint remaining with householders, stored in garages and sheds – it is believed that on average every household has 17 part-filled cans of leftover paint[1].

Of the 50 million litres potentially available, 20 million litres are estimated to be of potential use for re-use or remanufacture (the remaining leftover paint is either of poor quality or of a type not suitable for remanufacture). At present, less than 10% of HWRCs are collecting paint for re-use or remanufacture, and less than one million litres of leftover paint are being recycled.



Courtesy of AkzoNobel Decorative Paints

This report, a Resource Efficiency Action Plan (REAP) for the UK decorative paint industry, clarifies the current situation and, through discussion of the challenges associated with paint recycling, proposes an overall plan of action to find a solution to the issue. This is a long-term plan that will require participation and support from all stakeholders, to lead to a sustainable circular economy model for leftover paint. Ultimately, it may also require additional funding. This document was prepared during the same time period as the recent All-Party Parliamentary Group publication 'Triple Win: The Social, Economic and Environmental Case for Remanufacturing', in which paint was singled out as a major opportunity sector for remanufacture and reuse, with a key recommendation within the document specifically referring to the need for a REAP for leftover paint[2].

2. Origin of the Action Plan

The issue of waste paint and packaging was raised by Defra in 2007[3], which highlighted waste paint and garden chemicals as two topics of key concern. This prompted the British Coatings Federation (BCF) to work with its members, retailers and recovery schemes to examine the problem, and to identify possible solutions to it. This resulted in 2011 in the publication of a coatings industry report by the BCF[4].

This report was shared with Defra and a meeting was subsequently held in August 2012 to debate the topic. At the time it was confirmed that the UK government would not be introducing legislation in this area in the foreseeable future. As a consequence, the BCF's Decorative Coatings Council has continued its work to address the problem of leftover paint in the UK, resulting in this action plan.

3. Scope of the Action Plan

This Resource Efficiency Action Plan (REAP) is not of itself a solution to the problem of leftover decorative paint, but a plan of action to arrive at such a solution.

It covers the return, management and onward use of leftover decorative paint (including woodcare products) sold and used in the United Kingdom, where the waste under consideration consists of part filled paint cans remaining after completion of a decoration project (household, public or private building activity). These paints, stains and varnishes may be from individual householders, or from professional decorators, or companies employing such persons. Surplus paint available from retail stores and paint manufacturing locations could be included in re-use and remanufacturing processes, but this plan recognises that reprocessing arrangements are already in place for such sources of unused paint.

Paints and coatings used for industrial purposes are outside of scope, as are adhesives, fillers, floor coatings, wallpaper and other decorating materials. These materials are more problematic with regard to recycling, re-use and remanufacture.

In addition to the leftover paint, the recycling of the resultant empty packaging (plastic and metal) needs to be considered, and suggestions are included in the plan, in conjunction with other projects currently underway. However, the expectation is that solutions for this issue will come from groups and companies from within the packaging industry and packaging waste recyclers (e.g. BPF, MPMA, Ardagh, Crown Cork & Seal, Recoup, Earthminded, Boomerang, Avanti) rather than from the paint industry. We hope to link this project to the packaging industry schemes currently underway.

The Steering Committee have agreed on the following objective for the project:-

A voluntary commitment by the coatings industry, supported by government and other stakeholders, to help create a sustainable circular economy model for leftover decorative paint.

This will be communicated to stakeholders and the general public using 'PaintCare' as a brand for the voluntary commitment.

4. List of principal stakeholders and contributors

Paint Manufacturers

AkzoNobel Decorative Paints (the Dulux brand)
Crown Paints
PPG Architectural Coatings (the Johnstone's and Leyland brands)
Sherwin-Williams Diversified Brands (the Ronseal brand)
Farrow & Ball
The Valspar Corporation
Craig & Rose
UK SME decorative coatings companies (represented by the BCF)
Paint 'recyclers' / 'remanufacturers' / 'reconditioners' e.g. Newlife Paints, Paint 360, West Lancs Paints, Green Farm Paints, Paintmaster 2000

Trade Associations

The British Coatings Federation, BCF
The Confederation of British Industry, CBI
The Construction Products Association, CPA
The Environmental Services Association, ESA
The European Council of the Paint, Printing Ink and Artists' Colours Industry, CEPE
The British Plastics Federation, BPF
The Metal Packaging Manufacturers Association, MPMA
The Painting and Decorating Association, PDA
The Scottish Decorators Federation, SDF
The British Retail Consortium, BRC

Other organisations

Paint Research Association, PRA
Local Government Association, LGA and selected local authorities
National Association of Waste Disposal Officers, NAWDO
Department for the Environment, Food & Rural Affairs, Defra
Environment Agency, EA
Business, Innovation and Skills, BIS
All-Party Parliamentary Sustainable Resource Group, APSRG (through Policy Connect)
All Party Manufacturing Group, APMG (through Policy Connect)
Waste contractors e.g. Veolia, Hopkins Waste, FCC environment, SITA UK, Amey-Cespa
Packaging suppliers e.g. Ardagh Group, Crown Cork & Seal, Fenton Packaging
Major retailers e.g. B&Q, Homebase, Wickes, Wilko
Competition and Markets Authority, CMA
Third sector / charity organisations e.g. Furniture Re-Use Network
Paint re-users e.g. Community RePaint Network (run by Resource Futures)
Packaging waste recyclers e.g. Boomerang, Earthminded LC Services
Plastics recycling organisations e.g. Recoup
Building Research Establishment Environmental Assessment Methodology, BREEAM
Waste & Resources Action Programme, WRAP
Centre for Remanufacturing and Reuse, CRR

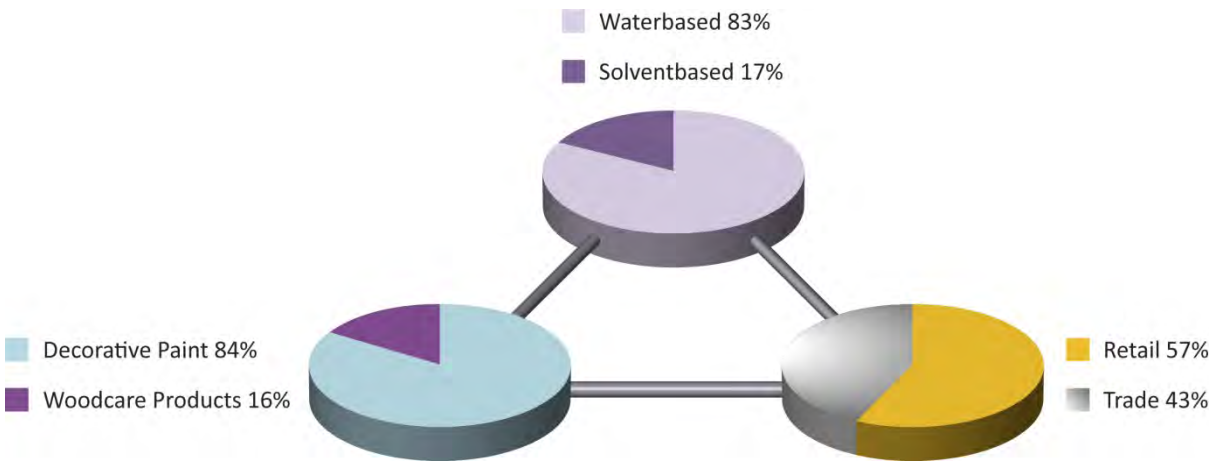
5. The UK decorative paint market – a snapshot of the industry

The UK Decorative Paint business is a mature market, with around 450 million litres sold in 2013 (this figure includes woodcare coatings)[5]. This volume has remained consistent +/- 10% for at least the past 15 years. The UK also exports an estimated 15 million litres of decorative paint each year.

Three companies account for the production of over 65% of the decorative paint sold in the UK – AkzoNobel (Dulux brand), Hempel (Crown Paints brand) and PPG (Johnstone's and Leyland brands). They manufacture the vast majority of their paint destined for the UK market in this country, however they are also all foreign-owned multi-national companies – AkzoNobel are based in the Netherlands, Hempel's head office is in Denmark, and PPG are based in Pittsburgh, USA. There are also significant quantities of decorative paint manufactured outside of the UK which are imported and sold in the UK market, including products from Germany (manufactured by Ostendorf) and the US (manufactur ed by Valspar). The largest company that is solely focussed on manufacturing decorative paint in the UK is Farrow & Ball (who have recently been acquired by the private equity fund management organisation Ares Management, based in Los Angeles). There are, approximately, a further 35 SME companies manufacturing decorative paint products, such as specialty paints, regional brands, woodcare, and ancillary items such as paint stripper.

Decorative paint may be sub-divided into solventborne coatings (primarily gloss paint for wood trim applications such as skirting boards and doorframes) and waterborne coatings, such as wall paints (for the interior of buildings), woodcare varnishes and fence paints. These paints are sold through national, regional and local retailers to both the general public (commonly referred to as the retail or DIY market) and to professional painters (referred to as the trade market). Decorative paints are sold in various pack sizes from 60 mls (e.g. colour match pots) to 10 litres (e.g. fence stains), packaged in both metal and plastic containers. Paint is available through the internet, but note that volumes sold through this route are not significant at present (estimated 3% of total UK paint sales).

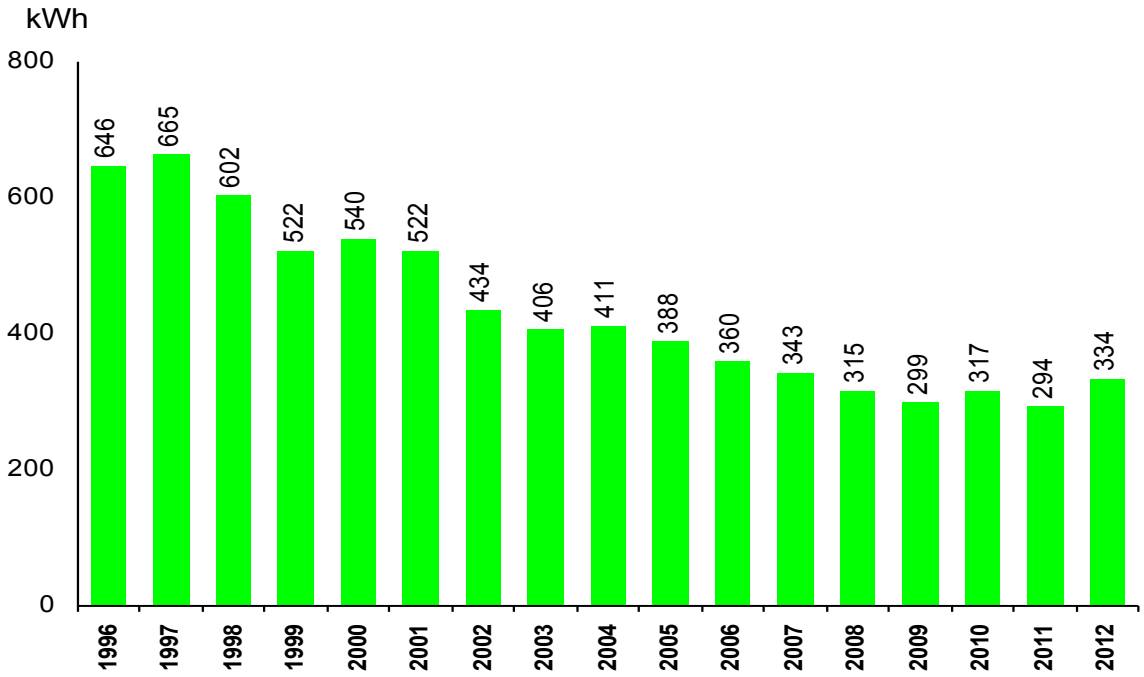
Market details for 2013 - decorative paint sales in the UK by volume[5]



6. How the paint industry continues to optimise the use of resources

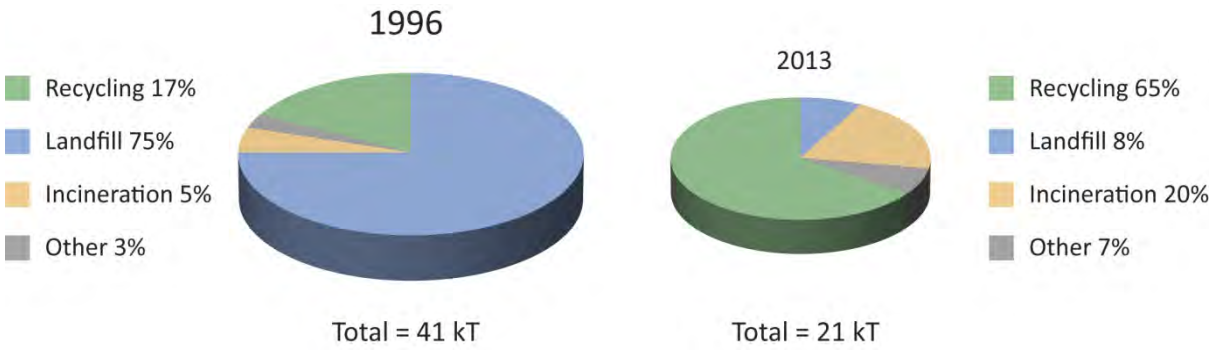
The UK coatings industry has focussed for many years on optimising the use of the different resources required for paint manufacture. The industry is highly competitive so many savings in resource use have already been identified and implemented, resulting in recorded improvements. Energy use over the past 20 years, for example, has been closely monitored through the globally-recognised and globally–utilised Coatings Care programme, as can be seen in the following graph[6]:

Energy use per metric Tonne of coating produced in the UK



The quantity and destination of waste from UK paint production facilities, as monitored by Coatings Care, also illustrates the efforts the paint industry has made with regard to improving environmental credentials – the amount of waste created by manufacturers annually has halved since 1996.

UK paint & coatings manufacturing sites – destination of waste



In addition to the above, and with their efforts to optimise logistics, many companies have recently invested in automation and introduced the latest production and handling processes, to ensure that paint is produced and packaged more efficiently than in the past. A good example of this is the new automated packing facility at Crown's production site in Hull, where over a £1 million has been invested in the past year, to improve filling speed by 75% and reduce cleaning water quantities by 50%. The new equipment also results in a reduction in energy demand and compressed air use.

One of the most important current projects for the coatings industry, not just for the UK but globally, is AkzoNobel's new site for Dulux paint production in Ashington, Northumberland. As reported in the media, *'The factory will reduce energy consumption per litre of paint produced by 60 per cent compared to today's operations by employing cutting edge manufacturing technology and the latest in building design, whilst also making large sustainability improvements by recycling and reusing waste and water'*. This new facility represents a truly state-of-the-art approach to environmentally-considerate bulk paint production, and ensures the long-term future for UK decorative paint manufacture[7].

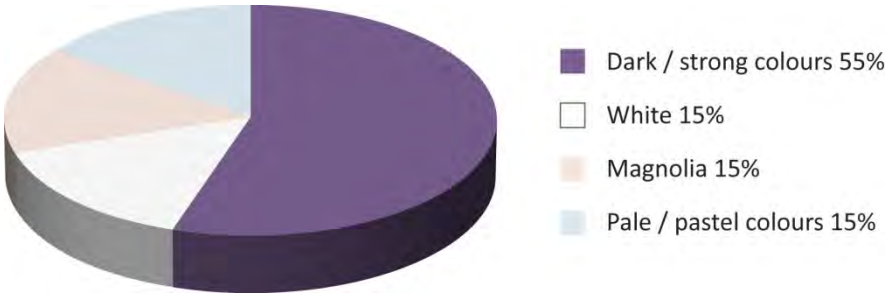
An additional area of focus has been on optimizing the quantity of paint purchased, and supporting consumers in their efforts to accurately determine the amount they require to complete a project. Considerable efforts have been made by paint manufacturers, and by retail and trade organisations, to explain to consumers the significance of coverage (how much paint is needed to cover a surface to be painted) related to paint type, application method, surface to be painted, and the existing colour of the wall, and to provide user-friendly guidance as to how to calculate the quantity they need to purchase. There are several paint calculators available on-line, where customers complete basic details on room size and product preference before receiving the recommendation, all to try and ensure that consumers buy the correct quantities and minimal paint remains left over after a job has been completed.

The main area where material savings & resource optimisation has not been fully explored to-date is in the handling & recycling / re-use of leftover paint.

7. Decorative paint - the current waste situation

It has been estimated that approximately 50 million litres of decorative paint (12% of total volume sold) is left over from projects each year. Most of this is from the DIY sector, although annual paint sales are around 45:55 trade vs. DIY. Professional painters and decorators are usually expected to use up their leftover paint for subsequent jobs, or to leave excess paint with the householder / at the location, reducing the trade contribution to the waste stream significantly.

Colour split for leftover paint currently received at Household Waste Recycling Centres (HWRCs)[8]



Courtesy of Newlife Paints Ltd

Around 40% of the HWRCs accept and segregate paint, mainly for onward incineration, with around 100 HWRCs collecting for re-use and manufacturing schemes. Significant quantities of paint also end up in landfill, through kerbside collection of residual domestic waste in wheelie bins. At least one company recovers solvents from waste solventborne paint and ink, although this is believed to be accounting for only a small volume of the overall solventborne paint collected.

It is believed that less than a million litres of paint is actually reused or recycled today. In addition, 78 million plastic containers (equivalent to 14,000 metric Tons) and about 50 million metal cans are used to package the decorative paint sold each year, only a small percentage are currently recycled.

8. Leftover paint - activity outside of the UK

Several countries (including some states in the USA, Australia, Canada, the Netherlands and New Zealand) have schemes in place to recycle and re-use leftover paint. Also, a number of institutions have studied the subject e.g. the Swinburne University of Technology, Victoria, Australia[9].

Following on from legislation by the Australian government in 2011, paint was identified as a Priority Product in 2013, as part of the newly-introduced Product Stewardship scheme. A successful Australian Paint Manufacturers Federation (APMF) pilot study was then run in Victoria in 2013, to determine the levels of waste generated in the trade decorative paint sector. A joint government / industry working group is now working to implement a national voluntary industry-led product stewardship scheme for Federal Government acceptance in early 2015.

One of the most successful schemes worldwide is the PaintCare (a non-profit organisation established by the American Coatings Association) program currently active in a number of states in the US[10]. This program has been set up in response to new state laws that require paint manufacturers to have a paint stewardship program in place to decrease the amount of waste paint. This program is funded by a levy applied to each can of paint sold in the relevant state, and is one model that may be considered for the UK, especially with regard to funding a scheme.

There are several paint recycling schemes in operation across Europe, including the Netherlands, where the Environmental Services & Waste Solutions organisation SITA has teamed up with the Dutch paint trade association VVVF, resulting in the start-up of production of recycled paint at Ursa Paints in Ijmuiden. There is also activity underway in Belgium, also in conjunction with SITA. However, these are currently functioning on a relatively small scale, with limited support from the major paint manufacturers in the region.

Additionally, there is now legislation in France, where the approach has been to assign responsibility to the paint producers and retailers, passing disposal costs back to the industry. This is managed and organised by the organisation EcoDDS[11], however there appears to be limited consideration regarding the destination of the paint that is being collected – the majority of paint still goes for disposal as hazardous liquid waste. A number of newer member states of the EU, e.g. Poland, are struggling to meet their waste reduction and recycling targets. These countries typically have not been able to finance and construct advanced waste management processes and systems commonly found in North and West Europe, nor do they have a sufficient tax base to construct one rapidly. A producer responsibility approach in these markets is expected to be introduced in the coming years.

The UK paint industry does not see a Producer Responsibility approach to leftover paint to be a suitable or ecologically sound method for the UK, as it does not necessarily address the core issue of what to do with the paint or lead to a circular economy model.

9. An opportunity - future scarcity of paint raw materials

Several materials used in the production of paint may become less readily available and inevitably more costly over the coming years. Specific mention should be made with regard to two major components of virtually all decorative paints: –

- the white pigment titanium dioxide, TiO2, derived principally from ilmenite ore, with considerable treatment and processing requirements to achieve an acceptable quality and powder form / purity for use in paint. This is costly both from a financial and ecological viewpoint. TiO2 is used in nearly all paints, including most dark tints, as it is the main contributor to paint opacity
- resin binders, polymers derived primarily from synthetic / petroleum-based monomers.

These materials are expected to continue to increase in cost, and are often sourced from outside of the UK (e.g. in the case of TiO2, it is common for many paint companies to source from China). As would be expected, the carbon footprint of such materials has a major impact on the final carbon footprint of the finished paints (the combined resin + TiO2 carbon footprint is believed to be > 65% of total Global Warming Potential (GWP) for paint).

Finding a way to recycle / re-use leftover paint will lead to a reduced demand for these highly processed raw materials, and a significant improvement in the ecological footprint of our paint industry.

10. Policy and legislative framework

There have been two major milestones over recent years with regard to the legislation of all coatings in the UK – the control of solvent use / Volatile Organic Content (VOCs), and the implementation of the EU's Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) legislation. The former was implemented over the period 2004-2010, restricting the amount of solvent and other volatile materials used in paint[12]. REACH became law on 1st June 2007, and is the method by which the selection of chemical substances used in paints and varnishes is controlled, ensuring the identification of specific materials that may be cause for concern with regard to their hazards and impact on human health[13]. As would be expected, general decorative paints do not contain any materials of major health concern, such as proven carcinogenic, mutagenic or reprotoxic substances. However the REACH process continues to identify further paint raw materials with issues of concern, some of which are essential to paint performance.

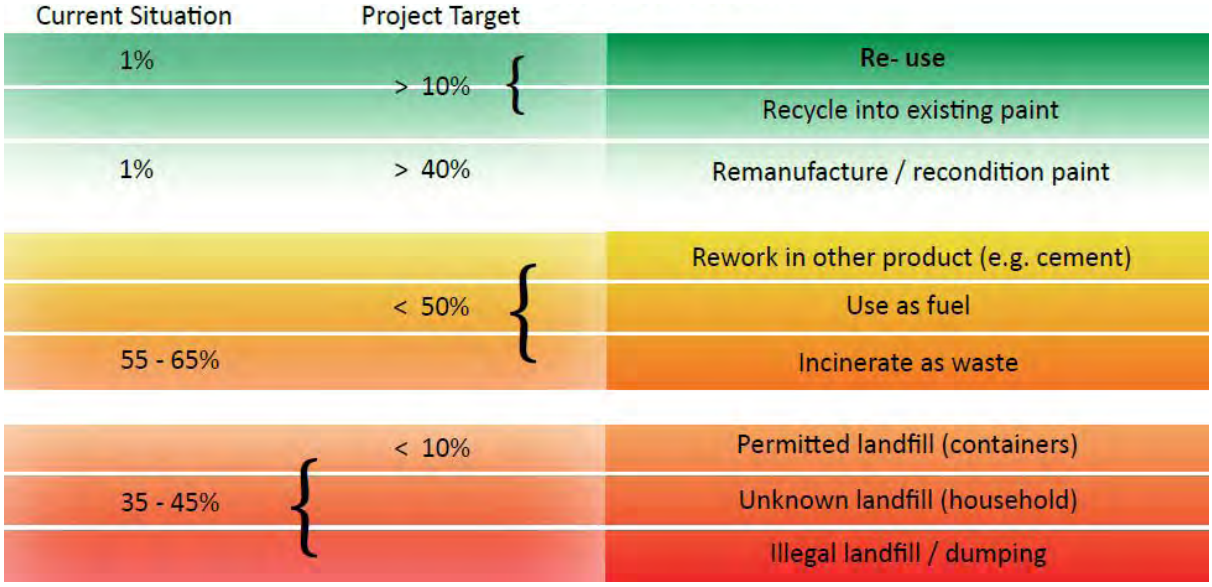
Leftover paint currently falls into the waste classification process, once it reaches an HWRC. This is another issue that will need to be addressed, through the use of the 'End-of-Waste' protocol process, controlled by the Environment Agency.

11. Leftover paint: challenges facing the UK decorative paint industry

The Local Government Association has confirmed that it will be starting a project on household waste recycling in 2015, in response to the likelihood that the UK will not meet the EU target of 50% recycling by 2020[14]. Paint, like other liquids, has been officially banned from landfill since 2007. What to do with leftover paint has therefore become a key topic for general discussion, and has become of interest to several wide-ranging groups, from business, industry, government & NGOs.

The options for diverting leftover paint from incineration and landfill to more ecologically acceptable solutions, and for accommodating the additional volumes currently still stored by householders, can be best visualised by considering the waste hierarchy for paint.

Waste Hierarchy of Paint



Courtesy of AkzoNobel Decorative Paints

As can be seen above, it is expected that a combination of options will be utilised, with ambitious targets to move over 90% of the waterborne decorative paint up 3-4 steps in the hierarchy to more environmentally-sound streams. For solventborne coatings (gloss trim paints), 'use as fuel' or 'incineration as waste' are the most likely options, although the route to solvent extraction from these paints mentioned above should be explored further.

The following are some of the key obstacles to increasing paint recycling in the UK:

- Inconsistent activity regarding waste paint disposal, right down to a truly local basis (by council)
- Limited number of schemes & facilities for the re-use and remanufacture of leftover paint
- Legislation and material classification (leftover paint needs to be reclassified as 'not waste', REACH requires all substances used in paint manufactured for sale in the EU to be registered)
- Lack of a market for remanufactured paint
- Lack of handling and storage capacity across the different infrastructures – at HWRCs, reprocessing centres and paint outlets

Herewith further details on three of these challenges:

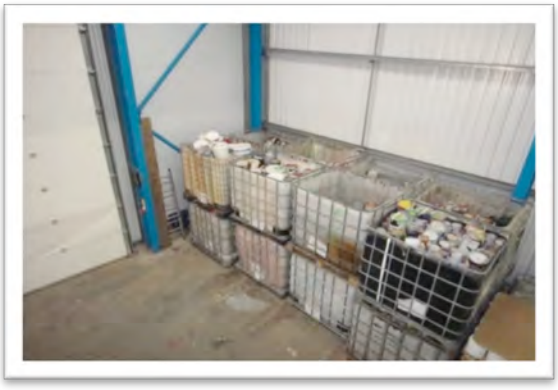
a) REACH – the components of remanufactured paint

One of the most significant challenges to setting up a new paint recycling / remanufacturing scheme is with regard to REACH legislation. To comply with REACH regulations, full knowledge of every component of new paint produced and sold in the EU market is required, to ensure that any hazardous materials are identified, and appropriate measures are taken with regard to labelling, handling and exposure control, thus safeguarding human health. Remanufactured paint will be using materials (leftover paint) for which only incomplete knowledge will be available, or may be safely assumed. Thus it will be impossible for remanufactured paint to strictly comply with the existing REACH regulations. There may be ways (perhaps through establishing the estimated date of manufacture of the leftover paint e.g. through studying its packaging design) to ensure that only paint complying with legislation since a set date e.g. 2007 is used in the remanufacturing process.

This is a fundamental issue that affects not just paint but the recycling projects and programmes for all the chemical-based industries in the EU (it is understood that plastics have also encountered the same obstacle), so needs to be addressed at a European or even global level, with the assistance of appropriate organisations such as e.g. the European Council of the Paint, Printing Ink and Artists' Colours Industry (CEPE), the European Chemical Industry Council (CEFIC) and the International Paint and Printing Ink Council (IPPIC).

b) Receiving paint at Household Waste Recycling Centres (HWRCs)

The current recommendation on most paint packaging is for users to take leftover paint to their local HWRC. However, many HWRC do not accept liquid paint waste and refuse to accept any cans of paint for three main reasons: that it is more costly to process than to bin it; that they contain unknown liquid, which may be hazardous; and that the paint is in containers with trapped air, that could also be hazardous if sent for incineration. There is a widespread perception from the householder that paint is sent for recycling when such centres accept their leftover paint cans, however this rarely happens – only where a re-use or remanufacturing scheme is in place (less than 10% of the HWRCs in the UK). HWRCs are owned by the Local Government Associations (LGAs), and are either run and staffed by councils (metropolitan, county, London borough or unitary authority and devolved authorities in Scotland, Wales and Northern Ireland), or by waste contractors. Note that recycling of domestic recyclable waste (paper, glass, plastic etc.) is often the responsibility of district councils.



There are 1,055 HWRCs in the UK, of which 87 are involved with supplying the re-use sector (Community RePaint scheme), 320 accept paint that then goes for incineration or landfill (and a small number working with remanufacturing organisations), and the remaining 648 do not collect paint (however may accept occasional cans unofficially, which will go to landfill)[15].

On reaching an HWRC a member of the public may receive one of several distinct responses:-

- the paint will be accepted and put to one side (for storage and sorting)
- some solventbased paint will be accepted and put on one side, whilst some have responded that waterbased paint can be put into general waste (note this is not correct – legally paint must not be put into landfill)
- the HWRC may officially refuse it, but will make an exception for an occasional 1-2 cans
- suggest to fill the can with soil or sand, creating a pseudo solid waste that can then be accepted
- confirm that they will accept empty cans, thus putting pressure on the consumer to empty the contents of the can, possibly illegally (e.g. into domestic sewerage)
- straight refusal, without any guidance as to what to do

Obviously it is also possible for householders or professional painters to throw cans filled with waste paint into the landfill skip directly at the HWRC, disguised in black bags, or to include it in their residual waste for kerbside collection. There are also products on the market available that can be used to solidify paint to help with easing disposal, but these need to be purchased.

c) Limited number of schemes / facilities for re-use and remanufacture of leftover paint

Less than 2% of the annual volume of leftover paint is re-used or remanufactured, through various programmes, ranging from local community-based schemes to those working with LGAs & HWRCs.

i) Re-use and the Third sector

One of the most widely-recognised UK schemes is Community RePaint, run by Resource Futures (in operation since 1992, supported by Dulux since 1993, currently with 76 locations), working with local authorities, waste contractors, DIY retailers, and other organisations linked to charity or community initiatives. In 2014 Community RePaint saved 445,079 litres of paint from going to waste, redistributing 301,755 litres to community groups, charities, voluntary organisations and people in social need, at a minimal handling cost and for a fraction of the price of new paint (usually the paint is priced between £1 and £2 / litre)[16]. The organisation runs on a not-for-profit basis and Community RePaint schemes are often linked to other local re-use / recycling operations e.g. Furniture Re-Use, Children's Scrapstore.

The main limitation to extending this scheme is financial, with each location trying to be financially self-sufficient, through deals with waste contractors, and with the occasional assistance of local government and lottery grants. At present, the ceiling to the demand side has not been determined – demand currently exceeds the amount of paint available.

The belief is that re-use schemes could be expanded if financial barriers can be overcome but, at the current time, it is difficult to predict what share of the total solution can be delivered by them. Community RePaint often turns away offers of leftover paint due to the lack of a scheme local to where the paint is located (a key criteria of the scheme is to keep transport of the paint to an

absolute minimum). Many Community RePaint schemes operate on premises with limited capacity, and sell the paint in the original containers (which may not be in good condition).

It should also be noted that Community RePaint are also involved in a new initiative (Q1 2015), looking to start up a remanufacturing paint operation, utilising the existing re-use network outlets.

Some paint recycling programmes only function for specific time periods, and are effectively paint amnesties. Crown Decorator Centres operated 'Kick Out the Can' last year, when consumers returned their unwanted paint to specific Centre locations, for onward distribution to local community projects[17]. Also, Norfolk County Council held a series of paint amnesty days last year (September 2014), however there was significant disruption to the running of the local HWRCs as too many people came along with their unwanted paint.

Therefore, the Third sector has a key part to play in the project, but it remains to be seen what the limitations are to expanding existing schemes, to handle and onward sell the larger quantities envisaged.

ii) Remanufacturing as a business

There are a handful of companies operating in the UK that remanufacture leftover paint to produce quality paint, to be sold at prices approaching the standard price for new paint. Some of this paint comes from the waste streams - there are also significant quantities of obsolete and off-grade paint from retailers and paint manufacturers that is reworked and supplied back into the market.

Other companies have been involved in the past, however making this economically viable is a challenge. Balancing the income (from e.g. sorting) and the costs involved (e.g. disposal of unusable paint) is essential, as is identifying a market for the output. A total of up to 500,000 litres of paint per annum are processed through such remanufacturing programmes at present. This is expected to grow significantly (possibly 4-5-fold) by 2016, even without any assistance from a future national scheme[18].

The need for a market and established outlet network for remanufactured paint remains the biggest hurdle to the expansion of remanufacturing.

12. A Resource Efficiency Action Plan for Decorative Paint

Preparing the plan

The opportunity is now presented to create a consistent and harmonised national approach to handling leftover paint which meets the needs of all stakeholders – the coatings industry, local government authorities, the waste contractors, the retailers and, ultimately, the general public. By putting together this REAP the UK paint industry is taking a proactive role, meeting both corporate and governmental sustainability intentions, in order to create a viable recycling / re-use / remanufacturing national programme for waste paint.

Considerable savings for waste contractors and local councils will result from the diversion of leftover paint from current landfill and incineration to re-use and remanufacture schemes. However, there are also significant costs associated with the project (Annex 1), and it is believed that overall the programme cannot be self-funding unless the sale value of the output (remanufactured paint) is significantly higher than that currently achieved.

The BCF will manage and facilitate the preparation, discussion and implementation stages of this plan, and will be a key participant in all working groups. It is proposed to have a steering committee overseeing this project, and to divide the project into three working groups (Annex 2), with relevant stakeholders assigned to each group. It is expected for working groups to be meeting 3-4 times in the first year, so participants should be prepared to commit to the appropriate time to meet their obligations to this project. All meetings held during the course of this project will be under the standard conditions followed by the BCF committee meetings, especially with regard to competition law. In addition, a timetable for year one has been proposed (Annex 3).

Delivering and branding the plan

To avoid confusion with other BCF activities, a separate brand, PaintCare, has been adopted to deliver this plan. This brand has been successfully introduced into North America for their waste paint program, but it is essential to be clear that, although the plan is adopting the branding, there is no assumption that the outcome or business model will be the same as in North America. Specifically, there is no assumption that any solution will be funded by a levy or backed by legislation, although PaintCare is a potential vehicle for managing any funding that is secured.

PaintCare will be used as the scheme to capture the voluntary commitments (by the paint industry, waste contractors, local and national government) that will be made. These commitments can then also be registered on e.g. the Green Construction Board website (that is managed by WRAP).

A Resource Efficiency Action Plan, by working group and activity			
Responsible Group	**Section**	**Activity Focus**	**Priority**
Steering Committee	A	Financing a UK leftover paint circular economy scheme	1
	B	Strategy for national adoption of the scheme	2
Working Group 1 (Statistics, Markets and Output Strategy)	C	Leftover paint – volume, quality and type	1
	D	Reduce the quantity of leftover paint	1
	E	Finding markets for remanufactured paint	1
	F	The potential impact of remanufactured paint on new paint sales	1
	G	Develop a re-use strategy for waterborne paint	2
Working Group 2 (Legislation)	H	Reclassify leftover paint – 'End of Waste'	1
	I	REACH, VOC & biocide legislation for remanufactured paint	1
Working Group 3 (Technology and Logistics)	J	Collection and storage proposals for leftover paint	1
	K	Sorting and decisions - re-use vs. remanufacturing vs. rejection	1
	L	Develop a remanufacture network for waterborne paint	1
	M	Propose strategies for the recycling of waste packaging	2
	N	Develop a strategy for rejected / non-remanufactureable paint	2

Responsible Group – Steering Committee

A. Financing a UK leftover paint circular economy scheme

Managing waste paint will involve three core activities; collecting it, reprocessing it and reselling or re-distributing it. Each of these activity areas will require investment. It will be a key task of the Steering Committee to fully understand this.

However, the following assumptions can be made at the outset:

1. Collection and segregation from the waste stream is essential but funding is in the control of Local Authorities who already face severe financial pressures. Improvements in the collection infrastructure could come through some form of hypothecated surplus in the Landfill tax receipts accounts of the Treasury, which are estimated at £4 million for paint.

2. The current, very limited level of reprocessing is being mostly done either by small start-up businesses or by the charity sector. Whilst these enterprises may be able to just about cover costs on a revenue basis, capital is required to expand and grow the network. Investment in reprocessing facilities could come from a variety of sources.

3. Re-use of the reprocessed waste will be the critical issue. Entrepreneurs, major paint brands and other companies may devise and exploit their own commercial opportunities but evidence suggests that these will be built around the more easily saleable white / off white material. The majority of reprocessed material will be stronger colours and it is highly likely that this will require some sort of subsidy to enable effective reuse.
Finally, the successful co-ordination of a national process will require some investment in management support.

There are savings to be made from diverting the leftover paint away from existing waste handling routes (incineration and landfill) – see Annex 1 for details of costs and assumptions. Current remanufacturing companies rely on the income generated from sorting and disposing of leftover paint to cover the main overheads related to the business.

Once a robust market for remanufactured paint has been found, then there will be a more-readily identifiable value associated with the produced paint, which will help fund the re-processors. Economic models can then be more accurately determined, and conclusions can be made regarding the proportion of the waste that can be reprocessed and re-sold through a self-financing model without some form of subsidy, and what would be feasible with financial assistance. For this a circular economy business model study is recommended.

Specific funding for the above will then need to be secured, perhaps through a grant or other government-related funding programme. There are several specific possibilities to mention here – Innovate UK and the Knowledge Transfer Network, and the Innovation in Waste Prevention Fund from Defra (see www.wrap.org.uk/iwp2).

It is hoped that initial funding will also be secured for the setting up and coordination of the activity of the steering committee and working groups, but more importantly the action plan needs to establish the likelihood of delivering the not insignificant funds to make the project a reality.

Overall, initial calculations indicate that for the UK the cost will be in the region of £50 million, to sort 50 million litres of leftover paint and remanufacture / re-use 20 million litres. Clearly, funding may need to be sought through more than one approach – circular economy, resource efficiency management, waste prevention and re-use funding calls are currently in operation or planned for the first half of 2015.

As this project encompasses a broad range of activities, and has a number of ecological, resource-use and economical objectives and drivers, there should be an open consideration to all opportunities for funding, with future applications being fully justifiable and supported by this document.

Suggested Actions			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	Put together funding proposals as necessary that help unlock a national closed loop recycling programme for leftover decorative paint	BCF, CRR	On-going
2	Establish funding strategy for a circular economy business model study as detailed above	BCF, CRR, WRAP Defra, BIS	September 2015
3	Discuss with treasury / Defra potential funding options, from utilising revenue from paint landfill taxes, through to a green levy	Defra, Treasury, CBI Paint company CEOs, Ecolateral	March 2015
4	Deliver an overall marketing plan for leftover decorative paint based on all the inputs from the project	BCF, Paint manufacturers Paint remanufacturers	December 2015

B. Strategy for national adoption of the scheme

The intention is to evaluate the existing activities (both remanufacturing and reuse) to determine the feasibility for a national programme and to verify cost calculations within the business model. These studies will require full active participation from all local stakeholder representatives, including locations where Community RePaint schemes are already in existence, to ensure maximum capture of data and experiences. It is important to avoid duplication and conflicting activities taking place in the marketplace and within the industry.

Suggested Action			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	Review existing schemes and draw together best practice activities currently in place with HWRCs. Determine whether further pilot studies need to be done to address specific issues e.g. finance	waste contractors Paint remanufacturers and re-users, BCF	September 2015

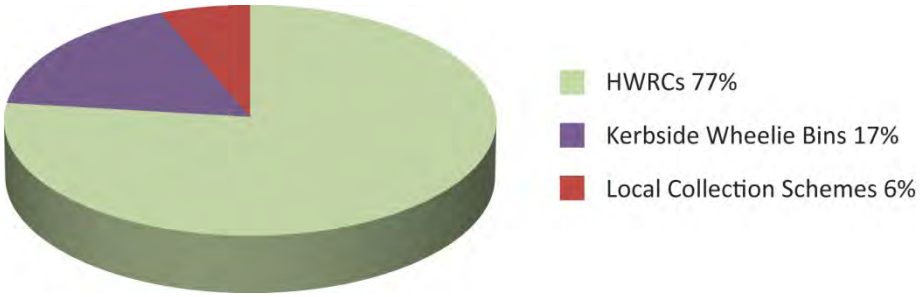
Responsible Group – Working Group 1 (Statistics, Markets and Output Strategy)

C. Leftover paint – volume, quality and type

A figure of around 50 million litres per annum for leftover paint has been referenced from previous work (e.g. R Slack, mid 2000s), websites and publications (e.g. WRAP report referenced 40 million litres from total sales of 310 million litres back in 1997[26]). The expectation is that around 20-25 million litres of this leftover paint would be suitable for re-use or remanufacture, 19 million litres has been calculated from HWRCs and the remainder from retailers and trade painters. These numbers have been derived from a series of research projects.

AkzoNobel recently commissioned a study by Resource Futures of 6 HWRCs that actively collect paint, along with an on-line questionnaire / survey between July and November 2013, and the data that they have collected from Waste Data Flow and Waste Analysis passing through HWRCs. The data was then extrapolated to present a national UK view on leftover paint[27]:-

Public disposal of leftover paint



Courtesy of Resource Futures / Community RePaint

Note that the 77% figure is higher than anticipated, may be due to the fact that this was through an on-line questionnaire, and not fully reflect the situation. It is believed that somewhere between 55 and 75% of leftover paint enters the waste stream through the HWRC route. From a separate survey of HWRCs it was calculated that 19 million litres of reusable paint could be expected to be available if all HWRCs were collecting.

Why can't all the leftover paint be used?

Some paint may be contaminated, may have solidified, or may not be of correct quality for further use. It is anticipated that any new scheme would need to run with similar collection restrictions as currently used by the Community RePaint locations i.e. paint must be in its original container, should be less than 10 years old and the container should be more than a third full (although current remanufacturing is often done with any quantity of paint).

The bulk of paint presented for recycling / remanufacturing will be waterborne decorative wall paint, but solventborne gloss paint, external house paint, fence paints and other woodcare products will also be returned and so need to be considered within the proposed scheme.

As indicated earlier, the majority of the waterborne leftover wall paint returned is expected to come from the DIY sector (probably > 90%), with the following colour / type splits expected[28]:

Split by Colour			Split by type	
White	10 – 15%		Matt	60 – 65%
Magnolia	10 – 15%		Silk	25 – 30%
Pastel Shades	10 – 15%		Remainder	5 – 15%
Remainder (dark / strong colours)	55 – 70%			

It should be noted that, in the initial phases, larger volumes may be expected to be available as householders clear their storage of old paint that may have accumulated over the past 5-10 years, or longer. It was found that, when an active collection and recycling scheme was promoted and started up for supplying one of the remanufacturing operations, an initial peak supply volume was reached first before stabilising at a lower level, due to full clearance of older leftover paint. This peak was estimated to be approximately 30% higher than the final stabilised weekly supply volume. This should be taken into account by the appropriate working groups.

Suggested Actions			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	**Data Collection** on leftover paint, collation of existing / historical data from re-users and remanufacturers and previous studies, and from HWRCs / Waste contractors **Information on product type and quantities, agreement on classification**	LGAs, Waste contractors Paint remanufacturers and re-users Local Authority Recycling Advisory Committee LARAC	September 2015
2	**Recording method for leftover paint** to be proposed, and a comprehensive reporting system agreed, so that leftover paint return and recycling activity is accurately tracked, strategies may be adjusted	LGAs, Waste contractors Paint remanufacturers and re-users	September 2015

D. Reduce the quantity of leftover paint

To minimise the generation of leftover paint, it is necessary to consider the causes, which are almost always linked to over-purchase, although some small amounts result from mistakes in colour choice, faulty product and damaged containers.

A major cause of over-purchase is the manner in which quantities required for a paint project are assessed. Although manufacturers give as much information as possible about coverage rates and how much paint they need to buy, the actual quantity utilised depends on the skill of the decorator, the porosity of the substrate and also the scale of 'colour change' taking place, i.e. more coats of paint are required to cover an existing dark colour. Also, most decorators would rather over-purchase than risk not having enough paint for the job, and then having to waste time and money in returning to the retail outlet to purchase more, with the additional risk of an inexact colour match between purchases. Efforts have been made in other countries to better service the trade painters on larger building sites, e.g. by having a mobile decorative paint shop visit the site and supply the paint on an as-required basis (see details with regard to Valspar's The Paint Drop scheme launched in November 2013[22]), and this may be worth consideration for the UK. At present, there are occasions where trade paint is supplied in IBCs to large UK construction projects, but only on a limited basis.

A second cause of over-purchase is price competition. For many products, small pack sizes are often disproportionately expensive, beyond reflecting differences in production costs, but the main issue is that paint is seen as a major promotional line by distributors to both consumers and trade users. Although most price promotion is on white paint, promotions on multi-pack purchases of coloured paint have become increasingly common.

Packaging optimisation has been a major focus for manufacturers over recent years. Current packaging, either polypropylene or tin-plate and either cylindrical or conical, has been continuously redesigned and refined to be fit-for-purpose. The available cans, usually two or three primary pack sizes, are selected according to local market requirements. There have been studies investigating the possibility of bulk supply of paint to outlets / retailers and then filling off as required by the consumer (such as the WRAP report from June 2011[23]). However this is a major technical challenge in terms of preserving product integrity and uniformity, and there would be significant risks of quality failures arising from such set-ups. Thus only specific pack sizes will continue to be available, and will be supplied ready for sale from the paint factories, which will always result in a certain quantity of leftover paint.

Suggested Action			
	Action	**Expected Key Contributors**	**Target Date for completion**
1	Continue the debate on what more may be done to reduce / minimise the amount of leftover paint annually created in the UK	BCF, paint manufacturers, Retailers	September 2015

E. Finding markets for remanufactured paint

The main challenge to existing remanufacturing schemes is finding a suitable market for the product. The intention from the current viewpoint is to sell the product within the UK, although other schemes have often included export markets as a viable destination. Ideally the scheme will be driven by demand from an end-user market, either the retail or trade decorative paint sectors, but demand could be bolstered by changes in Government procurement policy for e.g. affordable housing, which could specify the use of remanufactured paint.

The Green Public Procurement (GPP) initiatives in the EU currently under discussion may also play a part in creating a significant market and demand for remanufactured paint. For example, if an element of GPP could be to award points for using remanufactured paint in a project (e.g. through existing Green Construction schemes such as BREEAM or LEED). In addition, the increased use of Building Information Modelling (BIM) in the Construction industry may provide an opportunity to create a need for remanufactured paint by linking (through the product template approach) to ethical & green considerations when planning new construction activity.

There is a concern that current remanufactured paint is not widely accepted by the consumer due to a lack of confidence in the perceived quality of the paint. So consideration needs to be made with regard to the uses, and guarantees provided, for the final paint – especially for commercial or government projects. There is a concern over liabilities – the US PaintCare program, for example, requires that users of remanufactured paint sign a liability waiver before accepting the paint. Some kind of accreditation system / label may be one approach to consider.

The route to market also needs careful consideration – whether existing paint retail operators would be involved or other channels could be utilised. This may possibly involve the use of on-line ordering and delivery by carrier. Obviously there are implications with regard to the handling and carriage of the paint for an on-line business model, and reference should be made to appropriate legislation and documentation, as mentioned in the latest BCF guidance note of this subject[20]. Supply through the Third Sector / charity shops e.g. Oxfam, may also be considered as a viable option, perhaps with new branding incorporated into this approach, although this may need to be carefully distinguished from the existing re-use activity. Whatever the outcome, there will be a desire to closely monitor the sales and end-uses of remanufactured paint, at least for the first few years, to monitor the success of the project.

With regard to the Eco footprint (the various ecological parameters commonly measured and reported, including e.g. global warming potential / 'carbon footprint') of remanufactured paint, initial discussions suggest that these products will have at least a 50% lower ecological impact compared with standard paint (the generally accepted approach is to reclassify end-of-waste products as zero eco footprint once they have reached a waste facility)[21]. This should help drive the sales of remanufactured paint, and may well be a way of securing funding for the project.

If a scheme is successfully introduced into the UK then this may potentially serve as a reference for other schemes already under development, and as a blueprint for other European countries. This may be of particular relevance where the waste contractors involved are international companies e.g. Amey-Cespa (Spain), FCC Environment (Spain), SITA (Benelux), Veolia (USA).

Suggested Actions			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	Create drivers for the development of a market for remanufactured paint – consider GPP, outlets into trade and retail, government procurement policy and projects etc.	UK Paint companies CRR, WRAP, BRC Defra, BIS, APSRG	December 2015
2	Investigate the possible use of Green Building schemes such as BREEAM and LEED, and the increasing use of BIM, to ensure the promotion of remanufactured paint, that companies are recognised and awarded. It is recommended that the existing green scheme specifications be revised to reflect the possible use of remanufactured paint	CPA, BCF BRE, BREEAM, BIM WRAP, CRR	December 2015
3	Devise a method to track the use of remanufactured paint in the UK, so that the success of the scheme can be monitored	BCF, Retailers Paint remanufacturers	December 2015
4	Propose a national outreach programme and establish the cost	BCF, Retailers UK paint companies	December 2015

F. The potential impact of remanufactured paint on new paint sales

This subject needs to be carefully discussed, strictly following competition law, and with the appropriate legal presence.

G. Develop a re-use strategy for waterborne paint

It seems logical that the focus for any re-use activity centres around the existing Community RePaint schemes in operation, which currently run in conjunction with less than 10% of the HWRCs in the UK. One of the fundamental considerations of Community RePaint is the importance that costs are kept to a minimum, especially with regard to any further repackaging and sorting, and onward transportation and distribution of the paint destined for re-use. There may be a clear justification to support investment in sub-projects that could improve the efficiency of the Community RePaint operation e.g. using the latest IT capabilities with regard to tracking and tracing cans of paint, identifying and recording product movements and rapid matching of demand with supply on a very localised basis. Community RePaint have an objective to re-use 1 million litres per annum by 2020. A step change in re-use needs to take place for the scheme to become truly national, that will require significant investment and planning.

Suggested Actions			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	Develop a strategy to create a national re-use programme for leftover paint, based on the Community RePaint model. Identify possible requirements for investment as the paint volumes increase, and the obstacles to setting up additional locations for re-use.	Paint manufacturers Third sector	September 2015
2	Determine the limits to the possible re-use schemes in place, especially in terms of demand and capacity, and set expectations	Paint manufacturers Third sector	June 2015

Responsible Group – Working Group 2 (Legislation)

H. Reclassify leftover paint – 'End of waste'

Leftover paint is currently classified as waste and is thus subject to all relevant legislation with respect to handling and onward transportation, etc. Current schemes have obtained exemption licenses and waste carriage licenses to allow them to collect and proceed with re-use and remanufacture. This is acceptable whilst the volumes remain low, but if a national scheme is proposed then an official reclassification needs to be sought. This appears to be possible through a procedure managed by the Environment Agency (End of Waste protocol). There is now an on-line tool available for organisations to determine the End of Waste status of their materials, the conclusion to the recent EQual programme – see www.IsItWaste.org. Once the end of waste label may be applied to leftover paint then the normal approach is to consider the sustainability measurements to have been reverted to zero[24].

Suggested Action			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	Initiate procedure to reclassify leftover paint – no longer as a waste, but as a raw material for use in remanufacture. Use the IsItWaste webtool as guidance prior to submission. Complete and submit the application form	BCF, Paint manufacturers Waste contractors, Environment Agency	September 2015

I. REACH, VOC and biocide legislation for remanufactured paint

Current REACH legislation requires that coatings manufacturers confirm that all components used in their paints have been assessed under the REACH system, and that any hazardous materials or substances of concern have been identified, with the appropriate labelling on the finished can. However waste is outside the scope of REACH.

As the remanufacturing process will use leftover paint (with unknown components) it will be impossible for manufacturers to confirm whether the materials they have used to produce the remanufactured paint are REACH compliant or not. Assumptions may be made with respect to the quality and components of the leftover paint (which are easier to make if the paint is e.g. < 10 years old), however the official REACH status of the leftover paint will remain unknown, so a mechanism and a procedure to ensure good manufacturing practice will need to be created. As this is a Europe-wide issue it is expected that organisations such as CEPE (the European paint federation) will play a major part in addressing this issue. It has been reported[25] that end-of-waste products are exempted from registration provided that the substance has the same

composition as the registered substance that was originally put on the market. This still needs verification and confirmation.

It is expected that there will be significant volumes of non-UK manufactured deco paint available as leftover paint as several of the private label retailers source product from abroad. It is not expected that this will cause any major issues to the scheme (these paints have to comply with REACH and other legislation regarding raw materials), however this may have implications regarding the remanufacturing claims and onward marketing.

In addition to REACH, the VOC content of batches of remanufactured paint will also need to be monitored, to verify that they meet the current legislation requirements, although this is not expected to be a problem, as legislation has now been in force since 2010. Additionally, information on the biocide content and active type will be required, to ensure correct current labelling protocols are followed and to adjust preservation levels during the process to ensure product integrity for the duration of its shelf life. One suggestion has been to consider incorporating specific processes to treat the paint, to ensure its long-term condition for onward use e.g. a gamma irradiation treatment to destroy any bacterial growth and biocidal system, allowing remanufacturers to subsequently apply fresh preservation treatments.

Suggested Actions			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	Work to determine a Europe-wide approach to paint remanufacturing with regard to REACH classification, establishing a route by which remanufactured paint may be compliant. Confirm whether reports that end-of-waste is exempt from REACH are correct	Paint manufacturers CEPE, CRR, Defra, Cross-sector REACH group APSRG	December 2015
2	Implement methods as part of the remanufacturing protocol to ensure that the final paint quality meets with VOC and other legislation e.g. related to biocide content	Paint manufacturers Paint Remanufacturers	December 2015

Responsible Group – Working Group 3 (Technology and Logistics)

J. Collection and storage proposals for leftover paint

There are several collection options available:

1. Customers return leftover paint direct to retailers (as done in the US PaintCare program)
2. Customers take leftover paint to new collection points
3. Waste contractors collect direct from households as kerb-side collection / recycling boxes
4. Householders take leftover paint to their local HWRC
5. Professional trade painters take paint to their local HWRC (weighed and charged)
6. Collection of leftover paint is linked to home delivery of new paint to householders (new paint for old leftover paint exchange on delivery) e.g. via internet sales

The first option has been explored in the past through various regional schemes. However there are significant issues to overcome, especially with regard to identifying storage space, and the difficulty of having a 'mixed use scenario' for a retail outlet with new product and waste handling on the same site. Also, it is not expected or common for members of the public to return unused paint to the retailer when they visit to buy new paint. Options 2 & 3 are also considered to be unlikely scenarios for the UK as a whole, but perhaps option 3 could be a considered a possible solution for large urban areas. Other sectors have successfully introduced household collection schemes for specific items e.g. Nespresso coffee capsules in association with the 'CollectPlus' scheme.

It is now common practice in the UK for householders to regularly visit their local HWRC with materials for recycling. Also, this is likely to be the easiest and most cost-effective option to implement nationally, and is already happening in practice for those HWRC that accept paint as part of e.g. a Community RePaint scheme. It is acknowledged that this needs the agreement of the waste contractor stakeholders and Local Government authorities, and may well require additional storage capacity at existing HWRC sites, which may be a significant challenge, along with additional specialist training on how to handle and sort leftover paint.

With regard to leftover trade paint, a scheme could be put together, with the cooperation of the Painting and Decorating Association (PDA) and the Scottish Decorators Federation (SDF), to ensure that assessment methods for potential re-use, and collection procedures, are created without financial burdens for the trade. The equivalent contractor associations in the US play a key role in their PaintCare program.

The preferred storage method would be to receive and store the paints in their original packaging, placed inside metal or plastic transportation cages / containers, following the appropriate safety and environmental measures. The PaintCare program, for example, provides specially-manufactured tailor-made plastic trays for safe collection. Community RePaint also have specially-designed metal shipping-container-style units for paint storage at HWRCs. Current remanufacturing operations use empty waste IBC containers with the tops removed. It will be beneficial, and should be considered essential, for products to be retained in their original packaging up to the point where they are sorted and segregated.

Suggested Actions			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	Map out current infrastructure for HWRC across the UK, and procedures for leftover paint handling – identify those locations that currently accept paint and how they store it	Paint remanufacturers and re-users Waste contractors, LGAs	September 2015
2	Reach consensus on whether the HWRC network may be used for a national paint recycling scheme. If this is rejected then identify and pursue alternative options	LGAs, EA, NAWDO Waste contractors	December 2015
3	Identify and discuss key obstacles to setting up paint waste recycling at all HWRC sites, especially focussed on storage capacity and HSE requirements	LGAs, EA, NAWDO, Waste contractors, Paint reusers and remanufacturers	December 2015
4	Consider possible ways to collect and process leftover paint from the decorator / trade sector	Paint reusers and remanufacturers, BCF	December 2015
5	Agree upon and standardise a method, container and mode of transport for the collection and storage of leftover paint	LGAs, EA, NAWDO, Waste contractors, , Paint reusers and remanufacturers	September 2015

K. Sorting and decision-making - re-use vs. remanufacturing vs. rejection

Competent trained personnel located at the HWRCs (either council workers or employees of waste contractors) will be required to assess the leftover paint, to determine whether the paint may be used for re-use or for remanufacturing, or whether it needs to be rejected. At present many paint companies use the VOC globe logo colour-coded system to indicate VOC content, and this may be an easy way to initially sort different paint types, although the globe is not mandatory for all UK paint sold. It would be preferable if the majority of the sorting process was done at the HWRC (as is currently done with certain re-use schemes), to avoid unnecessary transport of waste paint that may subsequently be rejected and returned. It is likely that a pre-sort process would be carried out at the HWRC, followed up by a detailed sort at the remanufacturing / re-use operation site. It is not expected that any returned cans of leftover paint will be opened on site at HWRCs. The solventbased gloss paint will be segregated out, as will the non-wall paint waterborne decorative product types.

Sorting is a resource-intensive manual process – note that there are good guidelines already established for safe sorting available from Community RePaint (two page poster)[29]. It is essential that firm guidelines and procedures are in place and followed by trained personnel when opening cans of leftover paint, and subsequent handling. This will be one of the benefits to establishing a new scheme – ensuring safe operating procedures are in place wherever sorting activity is underway.

There are efforts underway to try and semi-automate this stage including the removal and draining of the leftover paint into the mix vessel (there is a consortium working on this project, comprising of AkzoNobel, Newlife Paints and Seymour-Powell). Establishing the estimated date of manufacture for the paint may be one of the parameters that need to be considered during this procedure (see later, related to REACH) – the possibility of using the packaging to date the paint may need to be considered, through the creation of a guide to paint can packaging design over the past 10-15 years.

An alternative approach would be for mobile trained personnel, working for the remanufacturing operation, to visit the HWRC sites and sort paint. Once the paint has been sorted, the quantity destined for remanufacturing may now be emptied from the original packaging and combined in readiness for onward treatment. So there may be a possibility to design a mobile collection vehicle that can allow both sorting and combination of e.g. whites and magnolias to occur at the HWRC rather than at a separate location. This would minimise the transportation of waste packaging.

However three issues would need to be carefully addressed – the presence and activity of non-HWRC staff at the HWRC; the possible risks to paint quality associated with combining paint in a mobile facility rather than in a fixed remanufacture / re-use site; and ensuring safe working practice of sorting staff, possibly in confined spaces.

Processes for handling and onward transportation of emptied packaging created from this sorting will also need to be devised – the expectation is for metal containers to be crushed into metal bales before entering the metal recycling waste-flow, whereas the plastic buckets may be shredded / pelletised and stored in big bags before being used for manufacturing non-critical components e.g. traffic cones. The main challenge with the packaging aspect is to devise a method by which the waste plastic containers may be adequately cleaned, as waterbased paint dries on polypropylene surfaces, and adheres to this substrate. Any work on plastic recycling needs to be done in conjunction with the Recoup project (see section F).

Suggested Actions			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	Establish a standard training procedure and manual to assess leftover paint, based on existing guidelines available from remanufacturers and re-users	Paint remanufacturers and re-users Waste contractors, LGAs	September 2015
2	Determine whether a semi-automated process may be introduced to sort and empty cans of leftover paint	Current consortium	Project has only just started
3	Propose a model for the sorting process, agree on potential use of mobile sorters. Consider whether some degree of combining the paint into bulk could be done at the HWRC (e.g. specially designed vehicle) bearing in mind the significant challenges.	Paint remanufacturers and re-users	September 2015
4	Establish whether the UK paint industry will support the general use of the VOC globe as an identity marker for paint	Paint manufacturers and retailers, BCF, BRC	September 2015

L. Develop a remanufacture network for waterborne paint

(Note - Please refer to the explanation of terms in Annex 5, regarding the difference between reuse, remanufacturing, reconditioning and recycling).

It is not thought that any major paint company is re-manufacturing post-use waste at the present time in any location worldwide, although many will have experience of re-working their own surplus or obsolete products.

Much of the leftover paint collected is expected to be suitable for remanufacturing or reconditioning. The models produced so far indicate that 40% of the collected leftover paint may be potentially used for remanufacturing (much of the paint collected will be too old or in poor condition, may be solventborne, or will be dark colours), amounting to possibly 20 million litres of waterborne decorative paint per annum. The process to remanufacture is expected to be broadly based on existing processes used successfully in the UK.

The intention is that the remanufacturing process will be a closed-loop process, with only minor additions of new materials required (water and additives, such as thickeners and preservatives). It is intended for the remanufactured product to be of first quality / as-good-as-new, and appropriate testing and performance will be checked during the quality control process to ensure this. The remanufactured product range will probably be limited to matt, eggshell and silk, and with a limited colour range to maximise efficiencies and meet potential demand. It may be possible to incorporate a colour matching process for large volume outlets e.g. public buildings, although the capability to reproduce volumes of the same colour for repeat orders would need to be carefully considered. The control and guarantee of shelf life for remanufactured paint also needs careful discussion, along with what guarantees could be provided with regard to the quality and durability of the paint, the need for careful stock control at the outlets, and a consideration as to whether remanufactured paint could be used for further remanufacture i.e. repeat cycles of the process.

At present, the major paint companies are reluctant to incorporate re-use / remanufacturing processes into their own operations. The main reason for this is the justified high level of concern with regard to the quality and bio-stability of returned paint.

The opportunity for contamination, and the subsequent impact on new production, is high, and considerable investment and careful material management would need to be established in existing paint plants to prevent this from occurring. It is likely that most major manufacturers would only consider using this material if it was their own product originally, and that the supply into the manufacturing site and process matched the same strict quality, hygiene and service standards of any other raw material.

The costs associated with sorting into separate brands would be prohibitive so it is not envisaged that this may be taken forward as an option. There are also the issues of closed tank manufacturing, storage and quality control of incoming paint to consider.

The expectation is therefore that a new network of regional remanufacturing / re-use facilities will need to be established to receive the leftover paint from the HWRC locations, with trained paint chemists employed as part of the operation. Existing facilities linked to other waste processing or remanufacturing operations, or to existing re-use operations would be the most likely basis for such a network.

Suggested Actions			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	Establish which leftover paint will be fed into remanufacturing – determine whether dark / strong colours may also be used in addition to the existing schemes running with white, magnolia and pastels	UK paint manufacturers Paint remanufacturers	September 2015
2	Review the success of current remanufacturing operations, and identify white spots where there is a potential for expanding remanufacturing operations. Estimate the optimum for a national network, to reach economies of scale	UK paint manufacturers Paint remanufacturers	December 2015
3	Agree manufacturing and performance standards for remanufactured paint e.g. through a PAS / voluntary code / certification scheme	UK paint manufacturers Paint remanufacturers British Standards Institute	December 2015

M. Propose strategies for recycling waste packaging

A project being managed by the 'Recoup' organisation, and supported by manufacturers of polypropylene paint containers, is focussed on finding a long-term process to ensure that more plastic containers are recycled. This does happen currently, but on a very small scale due to technology issues and the questionable business case. Empty (or nearly empty) metal containers are usually recycled, if they can easily be segregated from the general waste stream.

Suggested Actions			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	Establish onward outlets and processes for the waste packaging resulting from the setting up of the scheme, and costs for the necessary equipment to process this packaging	Packaging Trade Associations Packaging recyclers Waste handling providers	December 2015
2	Liaise with Recoup on their proposed project work on plastic paint-can recycling	Recoup	June 2015

N. Develop a strategy for rejected / non-remanufactureable paint

Some of the rejected paint may be remanufactureable (e.g. floor coatings, trim paints) and there are organisations with some experience of this. However the overall volumes of these paint types are very low compared with waterborne wall paint, and there is additional complexity in terms of colour combinations and the technologies used for such paints. Other possibilities for using the rejected paint include the use in other non-paint rework applications e.g. into construction / concrete / to run cement kilns, or to a solvent reclamation facility, or otherwise into incineration. There are additional projects underway that are looking to address the technical challenges to making use of the different solventborne paints which are currently hazardous waste and directed to landfill e.g. the Stopford UK project on encapsulating hazardous paint waste into fly ash for onward use in the construction industry.

If there is an economical case to justify this, then the solvent reclamation option may be considered and employed (with solvents being re-used and the sludge going to incineration), bearing in mind the cost of transportation to a reclamation facility, otherwise the expectation is for these products to end up in the streams for use as fuel or in incineration. It is not expected that large quantities of solventborne gloss trim paint or other solventborne coatings will be suitable for remanufacture or re-use, due to the quantities involved, their classification as hazardous and the wide variety of product types and colours that will appear in the waste stream.

Suggested Action			
	Action	**Key Expected Contributors**	**Target Date for completion**
1	Establish onward outlets for solventborne coatings and other rejected paint types	Waste contractors Paint remanufacturers	December 2015

Annex 1: Estimated costs associated with a leftover paint scheme

Summary of total costs for a national paint recycling programme for 48,000 mT (80% of 60 kT / 50 million litres)

		Total Cost Estimate (£)
At local authority HWRCs		
cost to landfill	Average £100-110/t	-
cost to dispose as hazardous	£500/t (9,600 mT)	4,800,000
cost to sort/send for recycling	£200/t (38,400 mT)	7,680,000
Total collection costs		12,480,000
Remanufacturing : 50% Paint to Paint, 50% sorted for raw in other products / fuel		
Manufacturing cost	£1000/t (19,200 mT)	19,200,000
Processing cost to other use	£500/t (19,200 mT)	9,600,000
Total processing costs		28,800,000
Programme administration (assumed at 10% of total cost)		5,160,000
Outreach / communication costs (assumed at 10% of total cost)		5,160,000
Total national paint programme cost estimate		**£ 51,600,000**

Recycled packaging costs and savings still to be established

Annex 2: REAP steering committee and working groups

Steering Committee – Financing and Strategy

- Peter T Jones OBE, Ecolateral, Leicestershire UK
- David Cornish, AkzoNobel Decorative Paints, Slough UK
- Brian Widdop, Crown Paints, Darwen UK
- Vincent O'Sullivan, PPG Architectural Coatings, Birstall UK
- Stephen Percy-Robb, Craig & Rose, Edinburgh UK
- Craig Reaney, Sherwin-Williams Diversified Brands, Chapeltown UK
- Patrick Smith, Manor Coatings, Shipley UK
- Representative from the Retail sector, to be confirmed
- Representative from the Waste sector, Jacob Hayler, ESA, London UK
- Steve Snaith, British Coatings Federation, Leatherhead UK
- Tom Bowtell, British Coatings Federation, Leatherhead UK

Working Group 1 – Statistics, Markets and Output Strategy

Chair = Steve Snaith (BCF), legal participation required to ensure Competition Law is followed

UK paint manufacturers and remanufacturers, large and small companies evenly represented. Trade associations, retailers, government bodies, non-governmental organisations

Working Group 2 – Legislation

Chair = Trevor Fielding (BCF)

UK paint manufacturers and remanufacturers, large and small companies evenly represented. Trade associations, waste contractors, government bodies, regulatory experts

Working Group 3 – Technology and Logistics

Chair = Craig Reaney (Sherwin-Williams Diversified Brands)

UK paint manufacturers and remanufacturers, large and small companies evenly represented. Trade associations, packaging recyclers, local authorities, waste contractors, government bodies and non-governmental organisations

Annex 3: Proposed year one timetable for the REAP

Steering Committee met 15th January 2015, discussed general approach to the project

REAP to be launched to wider stakeholder group by 31st March 2015

BCF to confirm with stakeholders their participation and representatives by 31st March 2015

Working Groups to hold their first meeting before 31st May 2015

Project progress to be fully reviewed by the steering committee before 31st October 2015

	Q1 15	Q2 15	Q3 15	Q4 15	Action Completed?
Steering Group meetings					1st meeting was January 2015
Discuss funding options with UK Govt. CEOs, CBI, BCF					On-going
Set up Paintcare for the UK					On-going
Publish REAP to external stakeholders					
Working Group 1 first meeting					
Working Group 2 first meeting					
Working Group 3 first meeting					
Official Launch of PaintCare at BCF Conference, May					
Voluntary Commitment Go Live					
Finalise proposal for scheme funding					
Apply for scheme funding					

Annex 4: Case studies

Case Study 1 - Newlife Paints Ltd
Driving innovation in new paint technology

BCF member, Newlife Paints Ltd has perfected the art of remanufacturing paint at its West Sussex facility, making paint from leftover paint, which is sold in B&Q stores across the UK.

Newlife Paints Ltd, established in 2008 and based in Ford, West Sussex, professionally reprocesses and recycles waste water-based paint back into a premium grade emulsion. All products in their paint range guarantee a minimum 50% recycled content, made up from waste paint diverted from landfill or incineration.

Their product, Newlife Paint, launched to market at the end of 2009. In the first year of production, the business reprocessed over 100 tons of waste paint. This figure is significant when considering Defra's estimation that approximately 50 million litres of paint are headed for landfill or incineration each year. With production and sales growing Newlife Paints Ltd are increasing the amount of waste paint reclaimed year on year.

Key environmental achievements

- Utilises a new waste stream
- Low waste level in recycling waste paint pots, cardboard and paper
- The process is low energy/low carbon
- Recycled materials used including the paint pots

Technologies and innovations

- Technology used is transferrable across Europe
- Scalable process to suit large or small companies
- Utilises a minimum of virgin raw materials
- Produces a high quality end product

Working with the Environment Agency

Newlife Paints Ltd is regulated by the Environment Agency Solent and South Downs Area Environment Management team. The team has been consistently impressed by Newlife's efforts to drive good environmental performance beyond the requirements of regulation. As a result, their facility presents a low risk to the environment and the Environment Agency has been able to reduce the frequency of inspections on this site.

Keith Harrison, Managing Director of Newlife Paints, said: 'Coming from an industrial background, I found the regulatory aspects on the waste industry a whole new world, both extensive and complex. Our local officer was able to give clear and helpful guidance and the Environment Agency as a whole has been very supportive of our project and keen to see us expand and grow.'

Case Study 2 – Community RePaint (Resource Futures)

Community RePaint Wirral

Background:

There has been a Community RePaint scheme in Wirral since 2006. However it is only since August 2013, under ReciproCity management, that the scheme has developed into one of the largest schemes in the network, who is on target to redistribute approximately 25,000 litres of paint in 2014. Prior to the scheme being taken over by ReciproCity Wirral, a community building materials reuse centre, there was a small scheme operating on limited hours and personnel which processed approximately 200 litres of paint per month. There was a desire to keep a scheme running in the area and due to the synergy between their existing operations and support from Resource Futures, ReciproCity decided to bring the community resource into their existing project.

All schemes in the Community RePaint Network face challenges when reusing paint which occur during the key stages of sourcing, sorting and storing, and redistributing paint. These stages, along with Community RePaint Wirral's approach, are outlined below.

Sourcing paint:

Community RePaint Wirral has found that once there is a clear understanding of the scheme and how it operates companies are receptive to working with them. The main confusion comes from people's misinterpretation of the scheme thinking they undertake recycling rather than reusing paint. The scheme has had no problems securing a constant supply of paint, as they are very proactive in looking for new contracts and opportunities.

Example of a container at a HWRC

To increase their paint volumes Community RePaint Wirral have established a diverse range of collection sources, maximising the paint they receive from households, traders and manufacturers. They receive householder's unused paint through partnerships with Local Authorities. The scheme currently collects paint from three Household Waste Recycling Centres (HWRCs) in Merseyside and two in North Wales, under contract. They are continually looking to increase these collections in other nearby areas. Paint is also accepted from a range of painting and decorating companies, paint suppliers and facilities management companies. These arrangements are either organised on an ad hoc basis or

are received as part of a longer term partnership agreement with companies, such as Dulux Decorator Centres and DIY retailers. This ensures that they have a consistent, reliable source of good quality paint. To ensure lasting relationships, the scheme maintains regular contact with donors and produces case studies about the charities and community groups benefitting from the donations.

Sorting and storing paint:

One key issue when collecting paint is the identification of paint that is not fit for reuse. Any unusable paint (solidified or 'gone off') needs to be appropriately managed and may result in a disposal cost for the scheme. To minimise the amount of unusable paint accepted by the scheme stringent tests are carried out at the point of collection. Each container is opened to check for quality and consistency and any unusable paint sourced from a HWRC is returned to the site for them to manage its proper disposal. Across the network it is vital that schemes working with HWRCs have such arrangements in place to avoid incurring costs for paint disposal. Any other paint accepted through traders or manufacturers would be managed by the scheme as waste and will incur a disposal cost for the scheme.

Paint displayed at Community RePaint Wirral

The quantities of paint received by the scheme can vary depending on the donor. With some paint donations being relatively small quantities it is becoming increasingly necessary to consolidate paint. This involves combining part containers of similar shades into one container, to ensure it is full (which is more attractive to the consumer), and then a small amount of the 'combined colour' will be marked on the container. Paint consolidation can be a complex operation that requires additional time, space and training. It also creates a large number of empty paint containers which, across the network, is proving to be the main issue with paint consolidation. Recycling these containers can be problematic. Metal containers can be 'sold' to a metal reprocessor for a small amount of income, although paint contamination can sometimes be an issue. There are currently few opportunities to recycle polypropylene containers and so they have to be sent for disposal as residual waste, which could incur a cost.

Given the unpredictability of the types and colours of paint that will be received it can be challenging to ensure there is a range of options for customers. Ensuring there is a large amount of paint coming in, and consolidating containers, are two ways to ensure there is a lot of variety on the shelves. Paint containers are organised by type and colour to ensure that it is easy for customers to find the right paint.

Distributing paint:

To ensure that the paint is redistributed within the local community the scheme has carried out extensive marketing. Use of the local press and events, flyers distributed to households and maximising use of social media has raised the profile of the scheme. Across the network paint is sold at a low cost - between £1-2 per litre - to all forms and varieties of charities and community groups e.g. sports clubs, nursery and primary schools, youth clubs, uniformed organisations, amateur dramatic groups and graffiti removal projects. As well as these groups, paint is also made available for families and individuals on low income and in social need, especially via housing associations. Community RePaint Wirral has found that one hurdle to people using the scheme to source paint is the prejudice people have about 'used paint'. For some people it can be hard to change their perceptions, however the scheme is clear in its communications that all paint is checked for quality and some tins are in fact unopened. All customers are given the opportunity to look at their paint before they purchase it.

Summary:

Under new management and increased resources, Community RePaint Wirral has significantly increased the amount of paint it collects and redistributes. They have faced a number of challenges in doing so which are common to the entire Community RePaint Network. The way that the scheme has addressed these challenges to significantly increase their processing of paint provides an excellent example to all schemes in the network of how to overcome the many obstacles faced when reusing paint. Community RePaint Wirral has shown that given the right resources a scheme can achieve incredible results.

Case Study 3 – PaintCare Program, USA

PaintCare Inc. is a non–profit 501 (c)(3) organisation (with a board comprising of architectural paint manufacturers and retailers) which was founded by the American Coatings Association (ACA) in 2009, in preparation to implement a paint stewardship pilot law passed in Oregon. The ACA determined that a Producer-run program was the best solution for the 65 million gallons of leftover paint annually created in the US, as there are limited local and state government resources.

The Oregon pilot study started up in July 2010 has now been permanently in place for over a year, with 140 collection sites (mostly retail outlets) collecting 500,000 gallons per year with an annual cost of $3.8 million. 96% of Oregon residents live within 15 miles of a collection site. Several other states have since started up PaintCare schemes, including California, Connecticut, Vermont, Rhode Island and Minnesota, and three more are under development (Colorado, Maine and the District of Columbia).

The California program started up in October 2012 and now has 700 collection sites (mostly retail sites), collecting just over 2 million gallons in its second reporting year. 98.5% of California residents live within 15 miles of a collection site. All PaintCare programs also offer a direct pick-up service for professional painters and other businesses with large volumes of paint (generally more than 300 gallons). More than 500 of these have been done across the active states.

The scheme is widely supported by the US paint manufacturers and industry and has the following prime objectives:

- Convenient recycling opportunities for households, professional painters and other businesses and institutions
- Sustainable financing model, protection from anti-trust violation
- Decreased cost and responsibility for local and state governments
- An industry operated paint management system, ensuring a level-playing field, and consistency from state-to-state
- Scheme accepts waterbased (latex) paints, solventbased (oil-based) paints, sealers, stains, lacquers and varnishes. Some limitations apply to volumes of solventbased paint from businesses. Specialty coatings and industrial paints are not accepted by the program.
- Tag line = Buy Right. Use It Up. Recycle the Rest.

The scheme is funded by a levy on the final cost of each gallon of paint sold, paid by the consumer as part of the overall price for the paint, which is then passed through the retail / distribution chain to the manufacturer, who then pays this into the PaintCare fund. The levy amount depends on the paint quantity sold: $0.35 / container for containers larger than ½ pint and less than 1 gallon; $0.75 / container for 1 gallon cans; and $1.60 / container for containers between 1 and 5 gallons. 75% of the cost of the program relates to the management of the scheme (transportation and processing), the remainder is required for the multilingual Outreach / Education activity and Administrative purposes.

About 70% of the waterbased paint received in the active states is remanufactured into new paint, 15% is used for an alternative product or beneficial use, 5% can be reused directly and 10% is landfilled. About 5% of the solventbased paint is reused directly, the remainder goes into energy recovery processing.

Annex 5: Explanation of terms

1. Paints vs. Coatings

Within the UK Coatings industry, the word 'coatings' is used as the general term that encompasses all coating product types, such as wall paints, varnishes, woodstains etc., applied with a brush, roller, pad, or sprayed. However the term 'leftover paint' is more widely recognised outside of the paint industry, and is therefore of more relevance and more generically used within this document. Therefore, for the purposes of this document, the term 'paint' should be considered as referring to all types of coatings, unless specifically qualified within the text.

2. Waterbased vs. Waterborne, Solventbased vs. Solventborne

The terms waterbased and waterborne (and likewise the solvent- equivalents) are synonymous – within the paint industry the suffix –borne is usually used, and the suffix –based is more widely recognised by the general public. Both terms have been used within this document.

3. Reuse, Reconditioning, Recycle, Remanufacturing

The document refers to these different terms in accordance with the APSRG terminology that was used in the document 'Remanufacturing: Towards a Resource Efficient Economy' published in March 2014, viz.

Reusing – the simple reuse of a product with no modifications

Reconditioning – the potential adjustment to components bringing an item back to working order, although not necessarily to an 'as new' state

Recycling – the extraction of a product's raw materials for use in new products.

Remanufacturing – A series of manufacturing steps acting on an end-of-life part or product in order to return it to a like-new or better performance, with warranty to match

4. Resource Efficiency Action Plan, REAP

The REAP terminology has been used for this document as a way of defining and capturing all the issues surrounding the reuse and remanufacture of leftover paint. It follows on from similar documents produced by other sectors e.g. for ceiling tiles in the construction industry. This is a recognisable format for presenting such information and plans to create schemes that address the issues of resource use in industry.

Annex 6: List of acronyms

APMG	All-Party Parliamentary Manufacturing Group
APSRG	All-Party Parliamentary Sustainable Resource Group
BCF	British Coatings Federation
BIM	Building Information Modelling
BIS	Business, Innovation and Skills (UK Government department)
BPF	British Plastics Federation
BRC	British Retail Consortium
BREEAM	Building Research Establishment Environmental Assessment Methodology
CBI	Confederation of British Industry
CEFIC	European Chemical Industry Council
CEPE	European Council of the Paint, Printing Ink and Artists' Colours Industry
CMA	Competition and Markets Authority
CPA	Construction Products Association
CRR	Centre for Remanufacturing and Reuse
Defra	Department for the Environment, Food & Rural Affairs (UK Government Dept)
EA	Environment Agency (UK Government department)
HWRC	Household Waste Recycling Centre
IPPIC	International Paint and Printing Ink Council
LGA	Local Government Association
MPMA	Metal Packaging Manufacturers Association
NAWDO	National Association of Waste Disposal Officers
PDA	Painting and Decorating Association
SDF	Scottish Decorators Federation
SME	Small and Medium-sized enterprises
REAP	Resource Efficiency Action Plan
VOC	Volatile Organic Content
WRAP	Waste & Resources Action Programme

Annex 7: References and acknowledgements

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Resource Futures (Community RePaint)

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