



INTRODUCTORY Q&A GUIDE

This interactive PDF guide provides an introduction to the topic of plastics in construction.

Click on a **question** to link through to the answer page. To return to this home page, click X on the answer page.

v2 April 2021

Authored by The Alliance for Sustainable Building Products

Peer-reviewed by the ASBP Plastics in Construction Group

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Why plastics in construction?

In recent years, awareness of the negative impacts of plastic waste and pollution on our environment has heightened. Popular television documentaries, such as the BBC's Blue Planet II, and mainstream media campaigns have played a significant role in bringing these issues to the forefront of the public's consciousness.

The focus of this has largely been on single-use plastics from consumer products and packaging. There has been little attention to the use of plastics in construction, both from a short and long-life plastic perspective. The construction sector's use of plastic continues to grow, but there is a lack of clarity on how construction plastics at the end of life are managed.

There is still much to learn about plastics in construction, such as the volumes of plastic used, types of polymers, their applications and lifespans. There is also growing evidence of the negative health impacts of plastics, for example, their toxicity in fires.

However, if we are to substitute some of the plastic we use in construction, then what is the effect of using different materials? There may be a lack of alternative solutions or information on how these materials perform compared to plastics.

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What do we know about plastics in construction?

For plastics in construction, it is estimated that in Europe the [construction sector](#) is the second largest user of plastics, consuming around 10 million tonnes of plastic in 2015 (around 20% of a total of 49 million tonnes). In the UK, [0.9 Mt of plastic were used in the construction industry](#) (in 2017).

Plastic waste from construction is [estimated to account for 6% of all plastic waste](#) (1.7 million tonnes)*.

- Polyvinylchloride (PVC) makes up nearly 52% (910,000 tonnes), with around 25% landfilled.
- High-density polyethylene (HDPE) makes up nearly 13% (225,000 tonnes), with around 27% landfilled.
- Expanded polystyrene (EPS) is 8% (140,000 tonnes), with 32% landfilled.
- Polypropylene (PP) is 7.4% (130,000 tonnes), with 27% landfilled.

*This figure does not include packaging.

For the UK:

- In 2017, an estimated 92,000 tonnes of plastic from construction was sent to waste facilities. This estimate only includes waste which is coded as plastic and does not include plastic if it is mixed with other wastes.**
- In 2014, [52,000 tonnes of recycled plastic](#) was used in the construction sector.
- 6% of plastic waste coded as construction waste was landfilled.**

**These figures have been estimated from the [National Waste Data Integrator](#).

Data from [Plastics Europe](#) states that in 2018 approximately a third of plastic waste was recycled in the EU (81% recycled inside the EU, 19% outside of the EU), 43% was burned in energy-recovery incinerators, and the remaining quarter was either landfilled or disposed of in some other way.

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Where is plastic used in construction?

Plastics are used in numerous applications in construction, including windows, pipes, insulation, cladding, cables and membranes. These are often long-lasting applications, where the material is fit for purpose for its intended function and is cost-effective in its use.

Plastic products with shorter life spans may be used in the interior and fit-out of buildings where their lifetime is dependent upon the upgrading of the interior space. These include paints, sanitaryware, flooring and furniture.

Much of the 'single-use' plastics in construction stems largely from building product packaging and the use of disposable plastic items on site and in staff canteen areas.

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What types of plastics are used in construction?

Six plastic types account for approximately 90% of plastics used by the construction sector (by weight):

- Polyvinylchloride (PVC).
- High-density polyethylene (HDPE).
- Polyurethane (PUR).
- Polystyrene (PS).
- Polypropylene (PP)
- Low-density/linear-low-density polyethylene (LDPE/LLDPE).

The largest uses include for tubing, piping, ducting and guttering (PVC, PP, HDPE); thermal and acoustic insulation (PUR, PS); door and window frames and other external profiling such as cladding, soffits and fascia boards, flooring and cabling (PVC); and waterproofing and linings (PE, PVC). There may also be the use of resins e.g. acrylic in paints, melamine in kitchen furniture and wood plastic composites e.g. flooring.

Plastic is also used for packaging of construction products, for example, the use of shrink wrap (made out of PP or PE), plastic banding (PP), and in other areas such as PPE, temporary protection and hoardings, adhesive containers and bulk bags.

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What happens to plastic waste from construction?

The fate of plastic products at the end of their useful life in the construction sector varies and we don't always know the disposal routes. An issue is that much of the plastic waste will be mixed with other wastes when it leaves a construction or demolition site and it can therefore be hard to track what happens to it. It will likely go as mixed waste into a transfer station where it will be sorted, unless there is a product take-back or recycling scheme in operation. At this point, some of it may become segregated for recycling, converted to refuse derived fuel (RDF), or landfilled.

Some products such as large diameter plastic pipes that are buried underground, may not enter the waste stream as they can often be filled and abandoned in situ.

Some products such as PVC window frames and cables are increasing recycled or downcycled into a lower grade product. Recovinyl, part of the EU's voluntary [VinylPlus programme](#), registered and certified 769,234 tonnes of recycled PVC in 2019. Half of this came from window and door profiles, 150,000 tonnes from cables, another 135,000 tonnes from membranes, flooring and films and 75,000 from pipes. The target for 2020 is 800,000 tonnes which represents approximately 14% of total PVC produced in Europe. However, early in 2020 the EU blocked the use of recycled PVC due to concerns over legacy additives.

Recycled plastic is sometimes not able to meet the same aesthetic or safety requirements as that produced from virgin sources. This can be due to some of the additives that have been used in the products in the past. For example, PVC recycled from window frames that were installed 25 years ago may contain higher levels of additives than are permitted today, such as lead or cadmium.

For single-use plastics, such as packaging used for construction products, this is also likely to go off site as mixed waste, unless there are direct recycling or take-back schemes in place.

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How much recycled content is there?

There is increasing interest in using recycled plastics for some applications, which can vary from product to product. In general this doesn't happen in large quantities and can involve downcycling to a lower grade product.

Recycled content in PVC cabling can be up to 50% and vinyl flooring at 60%. There are some plastic construction products which can be made from 100% recycled plastic. For example, the use of plastic hoarding, internal panels, outdoor furniture, damp-proof membranes and drainage systems.

Some types of plastics (e.g. PUR, phenolic resins, polyester) have to be chemically recycled into their basic chemicals and as such there can be limitations on how much recycled content these types of products can contain. These are known as thermoset plastics. Sometimes they can be used in other products, such as polyurethane foams which can be shredded into small flakes and re-manufactured into carpet underlay. Thermoplastics such as PE, PP, PVC and PS can be mechanically recycled and used to manufacture the same product.

Other types of plastic waste can be used as feedstock for building products. For recycled HDPE these include pipes, pots, crates and other moulded products. Recycled PET can be used in carpets, mats, pipes and for insulation, whilst recovered films can be turned into sacks, bags and damp proof membranes.

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What do we know about plastics in general?

The use of plastics is growing substantially; 8.3 billion tonnes of plastic have been produced since the 1950s and this is likely to increase to 34 billion tonnes by 2050.

The statistics for plastic consumed and the waste generated overall and per sector, varies significantly and in some cases detailed figures are not known. According to this study, worldwide it is estimated that:

- In 2015, 407 million tonnes of plastic (from virgin materials) entered the use phase and 302 million tonnes of plastic waste left the use phase (i.e. became waste).
- Around 9% is recycled.

A study estimated that, in 2010, between 4.8 and 12.7 million tonnes of plastics entered the ocean.

In Europe,

- Around 25.8 million tonnes of plastic waste are generated in every year, with less than 30% recycled.
- An estimated 26.5% of this plastic waste is landfilled, 47.5% is sent for energy recovery and 26% is mechanically recycled.



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What are the issues?

There are several issues with regards to the use of plastics, including:

- The use of fossil fuels - most plastics are made from fossil fuel raw materials (oil, gas and coal) and use fossil fuel energy in their manufacture. According to the [Ellen MacArthur Foundation](#) they account for 6% of total demand for oil and gas and 4% of greenhouse gas emissions, and in 30 years time this share could be as much as 20%. By 2050, when the global economy needs to generate net zero emissions, plastics emissions are likely to be three times greater.
- The mismanagement of plastics as waste results in plastics entering the environment and causing issues for wildlife. For example, during its recent [Great British Beach Clean Up](#) the Marine Conservation Society found 744 pieces of litter for every 100 metre stretch of beach surveyed. There is a particular issue with microplastics (particles under 5mm in size) because they are easier for marine life to ingest and subsequently, enter the foodchain.
- The loss of the raw material, which is often used to manufacture extruded plastic building products, is estimated to be the second largest source of direct microplastic pollution to the oceans. Globally, an estimated 230,000 tonnes of raw plastic material in the form of pellets (or 'nurdles', flakes and powders) is lost to the environment every year. In the UK alone the figure is estimated to be over 1,000 tonnes or the equivalent to 53 billion pellets.
- The lack of recycling infrastructure - we do not have enough infrastructure in the UK to deal with the plastic waste we produce, as such, some of it is exported; [in 2019 the UK exported 0.5 million tonnes of plastic waste](#). The most important export destinations were Turkey (19%), Hong Kong (12%), the Netherlands (9%), Malaysia and Poland (both 7%).
- Difficulties in recycling - not all plastics can be recycled, depending on their type, the local recycling infrastructure and levels of contamination. The British Plastics Federation have developed [Core Principles For Plastic Packaging Recyclability](#)
- The increasing use of plastic - this leads to more plastic waste being generated (particularly for single-use plastic), which then links to increased risks of waste mismanagement and difficulties in recycling.
- The loss of value - 95% of the value of plastic packaging material, between 70 and 105 billion EUR annually, is lost to the economy after a very short first-use cycle ([Ellen MacArthur Foundation](#)).

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Are there any health issues?

There are many chemicals used in the production of plastic, some of which may be harmful to our health, though it is difficult to obtain robust evidence for this. The health implications from the use of plastics are being studied and is largely focused on the research of microplastics; i.e. a [WHO study](#) on microplastics in bottled water, [King's College London's](#) work on microplastics in air and [Dutch research](#) on the effects of micro and nano plastic particles on health. Organisations such as [HEAL](#) have published [reports](#) on chemicals used in plastic.

In construction, there has been a focus on the potential health effects of the use of stabilisers and additives in PVC, which is used in pipes, windows and flooring. Some additives are now no longer used. These 'legacy additives' can also potentially cause issues for recycling. A report by [Perkins+Will](#) investigated the potential health hazards of PVC.

There may also be issues for human health, from the burning of plastics, with research showing that the widespread use of combustible materials increases the growth and severity of fires and produces a higher concentration of toxicants. The toxicity of common plastics is very much dependent upon the material composition and the fire conditions. The use of halogenated flame retardants does not provide a fire safety advantage, as the reduction in fire growth rate is compensated by an increase in fire toxicity. Some of this research was presented at the [ASBP Healthy Buildings Conference in 2019](#).

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What are the challenges for reducing plastics usage/ adopting alternatives?

There are a number of challenges facing the construction sector. Some of the same issues apply for both construction packaging and products.

- A general lack of information and knowledge on the number of plastics products and packaging used, their type and their longevity, when they will be generated as waste and how they are recovered. Without understanding this, it is difficult to know which areas to focus on. There is also an issue with the transparency of data for waste management and how it is measured.
- These challenges are across the supply chain. For example, once products get delivered to site, the manufacturer will have little knowledge of what happens to the packaging or any products that might be generated as waste. Contractors will work with many suppliers at various tiers, making it difficult to communicate and instigate change. Whilst designers will have influence on the types of products, they are likely to be far removed from decisions related to packaging. Clients who are interested in committing to less plastic, may be dependent on their supply chain in making this happen.
- For certain applications, such as drainage and electrical systems, there may be a lack of suitable alternatives, so in some cases plastics may have to be used. For single-use plastics, there are a lack of suitable alternatives for packaging that offer the same protection and are cost competitive. There is also a lack of information on their performance, economic and environmental impacts.
- When plastic waste is produced it can be difficult to recover, if it has been contaminated, for example by being mixed with other waste. It will at some point need segregating out into its polymer type; this is unlikely to happen on a construction site. Some plastic waste cannot be recycled easily and as such energy from waste is the likely management route. The relative amount of plastic waste generated on site versus the overall waste generated is likely to be low, which may make it more difficult to focus on plastic waste and derive cost and environmental benefits.

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What are the advantages of plastics?

There are many uses in construction where plastics provide a benefit:

- Plastics are often lightweight, strong and durable.
- Plastics are resistant to corrosion. (As a result of this they can take many years to degrade).
- Plastics can be highly flexible, malleable and mouldable.
- Plastics can be a cost-effective material with low maintenance requirements.
- On construction sites, plastics can be transported and manoeuvred relatively easy, although care must still be taken as some plastics can be brittle and/or susceptible to damage from ambient conditions (i.e. rain, wind, sunlight).

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What about the alternatives/solutions?

There are many different types of materials that can be used instead of plastics for construction products, however it is important to ensure that the products are fit for purpose and their performance is considered in the context of the building use and whole life cycle. [A report by ODI](#) has estimated how much plastic in construction could be substituted through dematerialisation and reuse and substitution.

For example, timber and aluminum can be used for doors and windows; timber, linoleum and stone can be used for flooring; aluminum and iron can be used for guttering; copper for pipework and natural fibres such as woodfibre, straw, wool, cellulose and hemp can be used for insulation. Other products derived from natural materials, such as cork, lime, cotton and flax are available.

The ASBP Natural Fibre Insulation Group seeks to raise awareness of natural fibre insulation products and systems through technical briefing papers, training and events. Find out more at <https://asbp.org.uk/group/natural-fibre-insulation>.

Many ASBP members offer alternatives to plastics or lower plastics choices such as [Bereco](#) (timber windows); [ARP Ltd](#) (aluminum guttering) (LINK:); [BIOHM](#) (mycelium insulation); [Lawton Tubes](#) (copper building services products) and [Mueller Europe](#) (copper piping).

There may not always be alternatives that are easy to find or are cost competitive; for example the use of plastics in electrical wiring. Plastics may also be present in 'non-plastic products' as resins, binders and additives; for example in paint and insulation.

For packaging, more 'non-plastic' solutions are being developed, though they are yet to be used widely in the construction sector. These include hessian, [wood cellulose](#), [organic waste](#), [seaweed](#), and [mycelium](#). Examples of compostable packaging include [Treetop BioPak](#). There are also the more traditional packaging types such as paper, cardboard, timber and metal. It is important to ensure that any alternatives are not worse for the environment overall – as some may have a higher environmental impact. The packaging used must be able to protect the product from damage and provide adequate health and safety protection.

In 2020, ASBP launched an [Innovation Pitch Series](#), which aimed to identify innovative alternatives to conventional plastic building materials and packaging. The [inaugural winners](#) were announced at the ASBP's 5th Healthy Buildings Conference in February 2021.

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There is a growing interest in biobased plastics, which are used mainly in packaging applications. They can be either biodegradable and/or use materials that are from biomass. They can contribute towards lower greenhouse gas emissions and demand for fossil fuels, but conversely could increase the use of natural resources and present further issues in waste management.

Some natural resources may not degrade without the intervention of industrial composting facilities and they can contaminate current recycling routes, as there exists a lack of infrastructure to deal with them. Other issues are the potential competition for land used for food production and encouraging deforestation to grow crops for bioplastics.

There are a few examples of use in construction such as [AirCarbon and Liquid Wood](#), and examples in the [Netherlands](#) using 3D printing.

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In the UK, are there governmental drivers for reducing plastic usage/adopting alternatives?

The Government introduced the policy, [A Green Future: Our 25 Year Plan to Improve the Environment](#) in January 2018 with the overall ambition to leave our environment in a better state than we found it. One of the areas of focus is increasing resource efficiency and reducing pollution and waste, including a target of eliminating all avoidable waste by 2050 and all avoidable plastic waste by end of 2042. There are a number of actions such as extended producer responsibility, possible bans, more research and development, labelling and greater recycling.

The [Resources and Waste Strategy](#) published in 2018, is the blueprint for eliminating avoidable plastic waste over the lifetime of the 25 Year Plan, doubling resource productivity, and eliminating avoidable waste of all kinds by 2050.

There are a number of commitments on plastics including extending producer responsibility for packaging, ensuring that producers pay the full net costs of managing packaging waste at end of life. To stimulate demand for recycled plastic packaging, a tax on plastic packaging with less than 30% recycled plastic content will be introduced from April 2022. Consultations and responses on these have recently been undertaken by the Government.

The March 2020 budget announced a [new tax on plastic packaging](#) containing less than 30% recycled content which will come into force in April 2022 and will be set at £200/tonne.

This is set to increase the use of recycled plastic in packaging by 40% – equal to carbon savings of nearly 200,000 tonnes. This is for the production and importation of plastic packaging and

will apply to a minimum threshold of 10 tonnes.

Legislation is also in place [banning distribution and/or sale](#) of plastic straws, plastic-stemmed cotton buds and plastic drink stirrers in England.

For construction, there is a commitment to explore extended producer responsibility for construction products and to develop a roadmap for the construction sector to achieve zero avoidable waste (ZAW); an [interpretation](#) of this has been published by the Green Construction Board.

There have also been regulations in place for packaging since 2007 which affect any organisation that owns packaging or supplies it; has a UK turnover in excess of £2 million per year and handles more than 50 tonnes of packaging per year.

[Obligated companies](#), be they raw material manufacturers, converters, packer/fillers, sellers, or importers, must: complete an annual data submission, which calculates the tonnes of packaging; and finance the recovery and recycling of packaging through the purchase of Packaging Recovery Notes (PRNs). Changes to these Regulations were [consulted on in February 2019](#) with a view to extending the scheme. These will be [consulted on further, with implementation from 2023](#).

Other similar policies and strategies exist in Scotland, Wales and Northern Ireland

Some Councils have plastic-free policies, such as [Frome](#) and [Lyme Regis](#). Penzance has [Plastic Free Coastline](#) status, provided by the organisation [Surfers Against Sewage](#). These are all focused on single-use plastics.

In terms of plastics use in construction, then some local authorities may prefer the use of other materials for heritage reasons (for example the use of timber windows rather than uPVC).



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The European Union produced the [European Strategy for Plastics in a Circular Economy](#) in January 2018, as plastics were identified as a priority in the previous [Circular Economy Action Plan](#). The strategy lays the foundations for a new plastics economy, where the design and production of plastics and plastic products fully respect reuse, repair and recycling needs and more sustainable materials are developed and promoted.

Targets for 2030 include:

- All plastics packaging placed on the EU market is either reusable or can be recycled in a cost-effective manner.
- More than half of plastics waste generated in Europe is recycled.
- Sorting and recycling capacity has increased four-fold since 2015, leading to the creation of 200,000 new jobs across Europe.
- Demand for recycled plastics in Europe will grow four-fold.

New regulation includes new EU-wide rules to target the 10 single-use plastic products most often found on Europe's beaches and seas, and the revision of essential requirements for placing packaging on the market. There is also the [The Circular Plastics Alliance](#) which aims to boost the EU market for recycled plastics to 10 million tonnes by 2025.

A new Circular Economy Action Plan has been published. It contains: a commitment to have mandatory requirements for recycled content; waste reduction for plastic construction materials; actions for associated packaging including - reducing waste and design for reuse and recycling.

There is also a section on construction and demolition waste encompassing actions such as a digital logbook for buildings, new recovery targets, waste from retrofit and a special mention for insulation waste and possible recycled content requirements. As the UK has left the EU we will not adopt this package but as a lot of manufacturers work across Europe, it will continue to have an impact.

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Are there non-governmental drivers for reducing plastics/using alternatives?

There are an increasing number of initiatives which are driving companies to take action that is mostly focused on single-use plastics and the subsequent generation of waste in the consumer and retail sectors. Although, none of these initiatives are focused on the construction sector.

These include:

- The [UK Plastics Pact](#), managed by WRAP, has over 130 businesses signed up across the 'plastic supply chain'. They aim to meet 4 targets by 2025 and are focusing on single-use plastics and a related road map. The focus here is on consumer and retail.
- The [New Plastics Economy](#), is a global commitment run by the Ellen MacArthur Foundation in collaboration with UN Environment. Signatories commit to three actions: elimination, innovation and circulation. There are over 450 signatories, some of whom operate in the construction sector, including Arup, BNP Paribas Asset Management and Philips.
- UN Environment has produced a [policymakers roadmap for sustainability for single-use plastics](#), which provides many case studies focusing on policy interventions.
- There are case studies at a community level, for example, [Zero Waste Scotland](#) is encouraging communities to step up reducing, re-using and recycling plastic at a local level as part of the Zero Towns Initiative. Surfers Against Sewage have the [Plastics Free Community](#) initiative and there are a number of American groups, such as [Plastic Free Town](#) and the [Plastic Pollution Coalition](#).
- The [UK Circular Plastics Network](#) (UKCPN) aims to bring together plastic product users through a programme of networking and knowledge-sharing events, managed by the KTN.
- The [Plastics Industry Recycling Action Plan](#) (PIRAP) includes increased collection of recyclable plastics, improved sorting and developing end markets for recycled plastics. Its implemented by the BPF and Plastics Europe, with the support of WRAP.

There are a number of public awareness raising campaigns related to plastic including the [BBC Plastics Watch](#), [Sky Ocean Rescue](#), [National Geographic Planet or Plastic](#) and articles from the [Guardian](#). Other Initiatives include the [Plastic Soup Mission](#) (LINK:) and the [SHIFT platform](#).

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There are many studies, largely Life Cycle Assessments (LCA) which show the impacts of using different materials. Often the results of these studies depend on where the boundaries lie, the data that is being used, and any assumptions made. Examples include:

- [Whole life analysis of timber, modified timber and aluminum-clad timber windows by the British Woodworking Federation](#)
- [The environmental Life Cycle Assessment of linoleum](#)
- [Life Cycle Assessment of hemp cultivation and use of hemp-based thermal insulator materials in buildings](#)
- [Life Cycle Assessment of the use of natural materials as thermal insulation in buildings](#)

There are also many Environmental Product Declarations (EPD) available for construction products, which include information on the type and amount of materials used, including plastics, the waste management routes and the impact of that product based on a number of impact categories. ASBP has a [workstream](#) and a number of free to download briefing papers on EPD.

No studies have been undertaken for the construction sector specifically, regarding the over-arching environmental effects, and potential unintended consequences, of moving from plastics to alternative products.

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There are many drivers for reducing plastics usage and adopting alternatives including: reputational; competitiveness; policy; legislation and environmental. Some manufacturers may produce whole life cost studies for their products as will some trade bodies.

- ARP Ltd, working with Exeter City Council have showed similar installation costs for seamless aluminum compared to plastic guttering. In addition, there are savings to be made from maintenance, in that greater maintenance is needed to achieve the life expectancy for plastic guttering which includes reseating in their brackets, rejoining and replacing broken brackets. Life expectancy may also be shorter.

There have been a few studies that look at the financial case for packaging. These have concentrated largely on consumer packaging. There are earlier studies relating to construction, which demonstrate the financial benefits of optimising construction product packaging, these were produced by [BRE for Envirowise](#) along with case studies for transit packaging. [WRAP](#) looked at the benefits of returnable packaging whilst another study examined [managing packaging waste on a construction site](#) and found this does not have financial benefits. [Valpak also did a study for WRAP](#) looking at optimising packaging for home improvement products, which identified cost and environmental savings.

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Who is the Alliance for Sustainable Building Products?

The Alliance for Sustainable Building Products (ASBP) is a cross sector, not-for-profit, membership organisation that is committed to accelerating the transition to a high performance, healthy and low carbon built environment, by championing the increased understanding and use of building products that meet demonstrably high standards of sustainability.

ASBP was launched at an event at the Palace of Westminster in November 2011 and now has over 80 members comprising; building product manufacturers and distributors, specifiers, designers, contractors, public interest and sustainability organisations, and other building practitioners.

ASBP's activities include organising topical events and conferences, participating in innovative research projects, championing exemplary low carbon building products and projects (see [ASBP Awards](#)), advocating robust product standards and informing policy across our core themes of health and well-being, resource efficiency and product sustainability. Find out more about ASBP at asbp.org.uk.

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What is the ASBP Plastics in Construction Working Group?

In April 2019, the Alliance for Sustainable Building Products endorsed a proposal to set up a new working group focusing on plastics in construction. The group is an output-oriented working group, bringing together stakeholders from across the construction value chain to learn collaboratively and address plastics in construction, in products and packaging.

Outputs include a [stakeholder mapping exercise](#) to identify plastics initiatives in the construction industry, a shared resource/introductory guide on plastics in construction (this guide), seminars and workshops, an [Innovation Pitch Series](#) to foster innovative alternative products, and pilot projects to test and prove performance of plastics alternatives.

Find out more about the group at asbp.org.uk/plastics-in-construction.

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Who is involved with the ASBP Plastics in Construction Group?

- [Accord Group](#) - Accord is one of the largest housing and social care organisations in the Midlands, providing 13,000 affordable homes and health and social care to 80,000 people and employing nearly 4,000. Accord is aiming to become the first housing association in the UK to build virtually plastic free houses in its attempts to reduce the amount of plastic used during construction.
- [ARPLtd](#) - ARP have been experts in the design, manufacture and installation of metal roofline products for over 30 years. Their family owned office and manufacturing facility is in Leicester and they partner with a network of Approved Installers covering the entire UK. Manufactured from mainly recycled aluminium the gutters are formed onsite to the exact required lengths, eliminating any waste in production. The aluminium is supplied in coil form, enabling long lengths to be extruded without the need to revisit suppliers. All components are supplied in woven bags or cardboard boxes.
- [Bereco](#) - Founded in 2003, Bereco are one of the leading suppliers of bespoke high performance joinery in the UK, having supplied over 200,000 windows nationwide to both new build and replacement markets. They are the only UK timber window and door company to use only FSC 100% softwood and hardwood sourced purely from an FSC certified forest. They believe passionately in protecting our natural world. If we demand sustainability in our products and services, the use of unsustainable products will decrease and the better off our planet will be.
- [Berkeley Group](#) - Berkeley Group builds homes and

neighbourhoods across London, Birmingham and the South of England. They specialise in long-term brownfield regeneration, focusing on challenging and complex sites that are beyond the scope of conventional homebuilders. They are highly collaborative, working with councils and communities to create a shared vision and unlock a mix of social, environmental, economic and commercial value that benefits all of our stakeholders.

- [Cullinan Studio](#) - Cullinan Studio are architects and masterplanners. They aim to make beautiful, useful and sustainable buildings and places. Their work crosses most sectors: cultural, education, health, housing and urban regeneration. Their projects are designed to be sustainable (socially, economically and environmentally) and they are a leader in new smart solutions for energy conservation and environmental protection. They celebrated 50 years of cooperative practice in 2015.
- [Flooring Manufacturers Sustainability Alliance \(FMSA\)](#) - the purpose of the FMSA is to work together to improve their ability to assimilate, understand and anticipate sustainability issues, to improve education in the field and to jointly work with and influence organisations and professionals who shape the sustainability landscape within which they operate.
- [Lawton Tubes](#) - Lawton Tubes was founded in 1918 in Coventry as a small engineering company. The business is still a family owned, fourth generation operation supplying sustainable copper and copper alloy products throughout the UK, Ireland and many export markets. The Lawton brand can be found in key sectors such as plumbing, heating, air conditioning and refrigeration,



medical gas services and engineering OEMs.

- [Mace](#) - Mace is an international consultancy and construction company, founded and built on exceptional people, a commitment to service excellence and an entrepreneurial spirit. Their vision is to be the industry leader in shaping cities and building sustainable communities. Mace works to be a responsible business, and part of their work within their Responsible Business Strategy 2022, is waste reduction - specifically plastics. Mace is seeking to reduce plastic consumption throughout the organisation as part of the 'Time to Act' campaign.
- [Mueller Europe](#) - Mueller Europe is based in the United Kingdom where they manufacture and distribute copper tube for plumbing, heating and industrial applications under the Wednesbury and Yorkshire brands.
- [Solus Ceramics](#) - A family run business, Solus has remained one of the most successful and trusted distributors of ceramics to the architectural specification industry since its inception in 1995.
- [Wienerberger](#) - Wienerberger provides built environment and infrastructure solutions that improve people's quality of life. Wienerberger's long-lasting, low-maintenance wall, roof and paving solutions reduce energy demand and material turnover in the built environment. Reducing unnecessary plastic consumption complements Wienerberger's commitment to promoting the circular economy in the built environment.

What about bioplastics?

We also have a number of organisations that participate in the group from time to time, providing their expertise and knowledge in areas related to plastic. These include:

- [Considerate Constructors Scheme](#)
- [Fidra](#)
- [King's College London](#)
- [Knowledge Transfer Network](#)
- [University of Cambridge](#)

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This group does not seek to advocate a completely 'plastic-free' built environment. We recognise that plastics have useful applications within the construction industry but they are overused. We support a reduction in the unnecessary use of plastics and encourage the development and adoption of suitable alternative materials, where available.

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- We are collaborative amongst our members and with other organisations working in the space - we don't want to "reinvent the wheel".
- We seek to bring clarity and transparency on the issues around plastics in construction.
- We aim to take a global, whole-value-chain approach.
- We are focused on creating tangible outcomes.
- We aim to engage stakeholders and recognise the power of storytelling on the emotive issue of plastics.

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Has the ASBP conducted previous work related to plastics in construction?

The ASBP's third annual [Healthy Buildings Conference and Expo 2019](#) (28th February 2019, London) focused on plastics in construction, with speakers:

- Emily Penn - eXXpedition founder, Parley for the Oceans and Sky Ocean Rescue Ambassador. Keynote speaker Emily splits her time between running eXXpedition - a series of all female voyages which focus on the relationship between plastics, toxic chemicals and female health - and working on solving the ocean plastics issue with Parley for the Oceans.
- Dr. Stephanie Wright - Research Associate, King's College London. Stephanie's research aims to capture and identify potential microplastics in air samples and, if of inhalable size, estimate human exposure levels and health impacts.
- Martin Gettings - Group Head of Sustainability, Canary Wharf Group. Martin updated us on Canary Wharf Group's campaign to eliminate single-use plastics and the steps the organisation are taking to achieve Surfers Against Sewage's 'Plastic Free Community' status.
- Jasper Hamlet - Project Office, Fidra. Jasper spoke on behalf of Fidra, an environmental charity working to reduce plastic waste and chemical pollution. He discussed the second largest source of micro plastic pollution in our oceans, small plastic pellets called 'nurdles', which are the raw material for many plastics products, including building materials.
- Professor Anna Stec - University of Central Lancashire. Anna is one of the leading experts on fire chemistry and toxicity. She discussed that fire toxicity is the biggest cause of death and injury in fires, but is unregulated and that material composition has a big effect on fire toxicity. Assessing fire toxicity is easy, and an essential component of fire hazard assessment.

ASBP has also published [think pieces](#), [blog posts](#) and [briefing papers](#) related to the use of plastics, for example in windows.

The ASBP also hosts the [Natural Fibre Insulation Group](#), which promotes the use of low impact construction products derived from natural materials such as timber, wool, hemp and straw.

See the ASBP website for more useful resources - asbp.org.uk/all-resources.

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Are there any examples of organisations tackling the 'plastics problem'?

Many companies, particularly in the consumer sector market are realising that their reputation may be damaged if they do not make substantial commitments to use less plastic or optimise the use of it, to ensure it is managed at end of life appropriately and to increase the amount of recycled content. This includes companies such as [Adidas](#), [Apple](#), [Coca Cola](#), [Iceland](#), [Morrisons](#), and [Waitrose](#).

In construction, there are a few examples of companies making public statements to reduce/optimize plastic. Those that do have commitments or are actively reducing plastics include ASBP Plastics in Construction Group members Mace (looking at reducing plastic onsite and corporately, with their [Time to Act](#) campaign) and Multiplex (looking at a number of schemes such as the [closed loop recycling of temporary protection](#)).

Others include Willmott Dixon with a [target to reduce overall waste intensity \(including plastic\) by sixty per cent. by 2020](#) and Canary Wharf Group has a [Breaking the Plastic Habit](#) programme. The Considerate Contractors Scheme has a [Spotlight on Plastics](#) campaign with links to case studies and best practice.

There are a number of design practices and sustainability consultancies such as [Cullinan Studio](#) and [Architype](#) that encourage the use of less plastics. Indeed, there are also many manufacturers, which offer alternatives to plastic products, such as [ARP Ltd](#), who manufacture metal and roofline products and [Bereco](#) who offer timber window and doors.

[Mueller Europe](#) and [Lawton Tubes](#) are collaborating on CuSP - the [Copper Sustainability Partnership](#). The initiative aims to challenge, educate and inform how copper plays a vital part

in a more sustainable future.

See the ASBP members list for examples of other innovative product manufacturers offering alternatives to plastics - asbp.org.uk/our-members.

More manufacturers are also providing take-back schemes for surplus products, offcuts or temporary materials. These include [Plaswood](#), [Protec](#), [Newton Waterproofing](#), [Recofloor](#), [Recovynl](#) and [Yes Recycling](#). There are also examples of reusable packaging systems such as [SQP](#) and [SAS Ceiling tiles](#).

Environmental building schemes such as BREEAM, LEED, Well and Ska have requirements for waste, material efficiency and materials environmental performance, though there is nothing specific on plastic.

The ecolabel [natureplus](#) recommends that only polyolefins should be used to manufacture plastic packaging for building products. Packaging made from PVC is generally not permitted and biocides must not be used. The [WELL Standard](#) has requirements for materials including those related to the restriction of chemicals.

[Fidra](#) are working on addressing pellet loss and there is the [Scottish Government's Pellet Loss Steering Group](#); a voluntary group of industry, governmental and NGO representatives trying to address this issue and trial a supply chain approach to tackling pellet loss.

We have created a stakeholders and activities map, which can be accessed via the ASBP website - asbp.org.uk/plastics-in-construction/map.

Are there any environmental benefits?

Is there a business case?

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INTRODUCTORY

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What research is being undertaken?

Analysis by Innovate UK shows that £54m of public research and development money has been invested in plastics innovation in the past seven years. However, there is little research looking at plastics in construction specifically.

The main research programme in the UK is the [Smart Sustainable Plastic Packaging](#) programme whose aims are to: establish the UK as a leading innovator in smart and sustainable plastic packaging for consumer products; deliver cleaner growth across the supply chain; generate a dramatic reduction in plastic waste entering the environment by 2025.

A key objective is to deliver research and innovation to support more plastic packaging recycling in line with the UK Plastic Pact targets. There are 3 work streams including a core programme, enabling research which is academia focused (more details on projects funded can be found [here](#)) and Collaborative R&D (CR&D) projects, which includes feasibility and demonstrator projects.

There are also research projects looking at plastic, which are funded through the European Union's Horizon 2020 funding programme, which has [allocated 350 million EUR to plastics-related projects](#).

The [UK Circular Plastics Network](#) run by the KTN aims to bring together the diverse users of plastic products and realise the best means for reducing plastic waste entering the environment. This is achieved through a programme of networking and knowledge-sharing events and related support activities.

There are a few Government funded projects looking at plastics in the construction sector, these include:

- The CHARM project, which aims to optimise reuse of materials and natural resources and to demonstrate innovative approaches for housing renovation and asset management that prevent downcycling. This involves Accord Housing Group (an ASBP Plastics Group member) who are building '[plastic free](#)' houses.
- [A review looking at using plastic waste in roads](#).
- Add at the EU level, there is a research project called [PolystyreneLoop](#) which is developing technology for the recovery of end of life construction PS foam waste.

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INTRODUCTORY Q&A GUIDE

This interactive PDF guide provides an
introduction to the
construction sector.

Click on
the answer
page, click

v1 June

PLASTICS IN CONSTRUCTION

WHY PLASTICS?

Why plastics in construction?

What do we know about plastics

Where is plastic used in construction?

What types of plastics are used?

What happens to plastic waste from

How much recycled content is there?

What do we know about plastics

WHAT ARE THE ISSUES?

What are the issues?

Are there any health issues?

What are the challenges for reducing
alternatives?

What are the advantages of plastic?

What about the alternatives/solutions?

What about bioplastics?

What needs to happen next?

In the construction sector, there needs to be a better understanding of the use of plastics. This encompasses several aspects, such as: what types of plastics are used; in what applications; their lifespans; how they are managed at end of life; health impacts; economic statistics and environmental data.

It is also important to understand how they are managed at pre-production stage as the sector can play a part in ensuring its products come from pellet loss free supply chains.

Better data is also needed for single-use plastic including the types and amounts that are used, how it is managed on site and waste management routes. This requires all parts of the construction supply chain to work together. This collaborative approach will enable the sector to understand how the use of plastic could be improved, and when it is generated as waste, the priorities and the related impacts of material substitution where it makes sense.

Running in parallel, is the need for the development and piloting of alternative products, training and guidance. ASBP are developing funding proposals, participating in research projects, as well as sharing knowledge via events, webinars and conferences.

We welcome comment and input from industry, so please [get in touch](#), [sign up to our free newsletter](#) and [consider joining our alliance](#).

Find out more at asbp.org.uk.

WHAT IS BEING DONE?

Examples of organisations
addressing the plastics problem?

What is being undertaken?

What needs to happen next?

WHY ASBP AND PLASTICS?

What is the role of Sustainable Building Products?

What is the role of Plastics in Construction Group?

What is the group?

What are the ways of working?

What has been previous work on plastics in

WHAT ARE THE DRIVERS?

What are the environmental drivers for reducing
alternatives?

What are the environmental drivers for reducing
alternatives?

What are the drivers for reducing

What are the benefits?

Is there a business case?

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