

Sustainable Building Products

As part of the AECB's Sustainable Building Hub, and in conjunction with GreenSpec (www.greenspec.co.uk), we are curating a selection of what we endorse to be sustainable building products and materials.

Our goal is that through identifying and promoting products, we can help raise the overall benchmark in the design and construction of sustainable buildings.

- 'Sustainable' or 'Green' building materials are those materials, products, systems and services which we know or have good reason to believe, embody one or more positive environmental attributes or qualities that distinguish them from other products or materials in the same function category.
- Environmental attributes can be enhanced by a product's contribution to application functionality and competent construction.
- Products are available in the UK.

Selection criteria

In reviewing a product or material, we look for it to meet with one or more of the following criteria:

- It conserves natural resources.
- It uses resources efficiently.
- Any emissions it makes are non-hazardous.
- It has low embodied energy.
- It makes efficient use of water.
- It saves energy.

- It uses transport efficiently.
- It is accompanied by an Environmental Product Declaration (EPD)
- It demonstrates manufacturer's standards
- It shows competence
- It demonstrates performance
- It enhances other materials as part of the construction element.
- It is accompanied by labels, endorsements or accolades.
- The manufacturer is committed to Corporate Social Responsibility (CSR)

Background

Sustainable materials: What? Why? and Why Now?

Industrial Revolutions and the Growth Economy 1760 -

The awareness of global warming and the need to reduce carbon output dominates the popular consciousness; That's only appropriate given the potential of the crisis to lay waste to vast tracts of the planet; however, an unfortunate and unintended consequence is to elbow a basket of other environmental impacts out of the spotlight.

Out of sight, out of mind

Because they don't always appear on the stage of public consciousness doesn't mean that non-climate change environmental impacts don't continue to be of concern. One of the problems faced is that much of the damage caused in the day-to-day is relatively intangible or gradual. Things appear to happen invisibly, remotely or too slowly.

Traditional environmental issues such as the pollution of land, water and air, carving out the landscape for resources, waste mountains and deadly levels of toxicity have been a constant undertow since at least the beginning of the nineteenth century. Then the human condition came quickly to endure the dangerous bi-products of industrialisation - corrupted air, smoke, dirt, poisoned water and squalor were manifest. Workers living in the shadow of a factory sustained chronic ill-health and shortened lives, yet were institutionally powerless to avoid their fate. The connection between cause and effect was straight-forward. Air pollution until late last century was literally 'in your face' and lungs. To live in a city was to be daily poisoned. The Great London Smog, which cost the lives of 4,000 people and damaged a further 100,000 in 1952, finally persuaded the state to take action. Through effective action, modern industry, homes and most power stations don't burn coal - the result is air that is mostly free of the 'killer' smog.

Although much of the traditional pollution associated with heavy industry has been eliminated or reduced, other insidious forms have expanded to fill the gap and more. Surprisingly, for example, we still seem to be able to live with transport exhaust which is a known source of lung and heart disease. Any sane society should have long-ago eliminated cars and lorries from the cities - and yet, only now, are some councils preparing private transport-free zones.

'Air pollution is the tobacco of the 21st Century' (*Institute for Public Policy Research, 2017*)

Pollution in the modern world - kicking our plastic habit.

Environmental damage and human toxicity are not limited to the burning of fossil fuels: development of manmade materials from oil stock and chemical derivatives has added to the size and complexity of harm. Damage to humans and environment rarely make it to the front pages - but occasionally it just comes through.

During the last year and after a century of uncritical use, one particular tv programme revealed the other side of our plastic habit. It was transformational. The ongoing fate of plastic is a striking example (and warning) of how a useful and apparently benign material can become environmentally demonised overnight.

'Plastic' is the term for a broad spectrum of long-chain polymers. Different polymers do different jobs from food packaging to buckets to medical equipment. Previously at worst only a nuisance, plastic's scale of damage has only now become apparent. It's not just supermarket bags blowing down the street like tumbleweed, plastic is understood to pass down the environmental chain where it disrupts ecosystems and destroys wildlife and ultimately poisons us.

At this point it's important to stress that the knowledge provided by environmental science and public health authorities struggles to keep up with developing technologies - often materials have been long in use before their dangers are understood. Examples are legion and include the likes of asbestos, halogenated fire retardants, polychlorinated biphenyls (PCBs), mercury, dioxins, lead, chlorophene, formaldehyde etc. The list goes on

This 'time lag' in the understanding the wider environmental and public health issues of new materials is one of the unfortunate and chronic features of our consumerist society. Products that obviously risk human health and safety are usually tested in the 'West' - if only to avoid costly insurance actions further down the chain. By contrast the health of the eco-systems that underpin our existence, continue to be beyond contemplation.

For people who are concerned with the environment, the 'row-back' necessary to restore equilibrium appears to be proportional to the inroads that a material has made into our daily lives. Until recently, plastic was universally considered near-irreplaceable. The task of eliminating so much that we depend on looks Sisyphean in prospect. Yet in a significant example of how the popular will can coral around an emotional progenitor, 'national treasure' Sir David Attenborough kicked-off a mini-social revolution against the use of plastic. Who wasn't revolted by sight on national tv of an animal choking on a plastic bag? Cynical perhaps, but it's a clue to how change can happen.

Out of sight, out of mind

The concern with plastic grabs the attention because of its ubiquity; Beyond that, beyond our collective consciousness, other industrial activities continue feeding our need for 'stuff'. Most of the things we make affect the environment to a various extent. There is now no reasonable doubt that our 'First World' way of life is

responsible for devastating the environment and putting the survival of future generations in jeopardy. Consumerism continues to diminish resources, reduce biodiversity, eliminate species of animals and wreck millions of lives in countries remote enough for some of us not to care. Bad enough too if it were but for the 'old' industrial nations - but the problems are only compounded and grown by the Third World playing catchup and feeding their own populations' not-unreasonable demands for equal 'wealth'.

It doesn't look good! Worse, the most destructive environmental issues are not on the popular radar. Repeating 'plastic action' on other damaging materials and processes is far more difficult. Unless we discover, or others make us aware of, the consequences of the lives we live, change is doubtful.

A society based on this industrial scale of consumption can't go on - it's not fanciful to believe that all indications point to an eventual concentration of environmental impacts. We will ultimately run out of oil, gas and many critical minerals. Biospheres such as the Amazonian jungle will disappear under cattle ranches or, as in Indonesia, palm oil plantations. Entire landscapes will become subsumed by mineral extraction or polluted by mining spills. Vast numbers of adults and children keeping us fed with food, computers, white goods and clothing will continue to be poisoned in their work places and exploited by their bosses.

In nearly all economic predictions that factor in the environment, 'Business as Usual' can't be an option. Something else has to happen.

Why our industry is important

The construction industry too shares a dependence on plastic. In only a few decades, amongst other materials, wood has disappeared from windows, iron from rainwater goods and linoleum, from classroom floors. Plastics replace the 'old' materials in cladding, rainwater goods, windows, cables, coatings, shuttering, membranes, flooring, thermal insulation and more.

Substituting plastic isn't going to be easy, or complete. But it can and is being done!

Plastic is only one example - the construction industry's use of fossil-fuel energy, materials hewn from the earth, smelted in the furnaces and formed in chemical processes contributes substantially to global warming and other environmental impacts. If change towards a sustainable future is to be achieved, then our own industry will have to turn to producing materials and processes that preserve our environment.

Getting started

Before defining solutions, squaring-up to the extent of the problem is the first task.

Quantifying the impact of construction is complex and currently much of it is unaccounted for, but some salient figures provide a lead:

- The construction sector worldwide currently accounts for more than 11% of global GDP (*PwC, 2011*)
- Construction accounts for around 40% of the total flow of raw materials into the global economy
- Construction in the UK accounts for around 90% of all non-fuel mineral use.
- The UK's building stock accounts for 50% of CO₂ emissions, construction adds another 7%
- Less than 2% of branded building materials and products have had their environmental impacts accurately quantified through Environmental Product Declarations (EPDs).

Much work needs done — understanding how each building material's impact on the environment is a mind-bogglingly colossal task. Yet demand for information is increasing as building designers consider the environmental implications of their specifications. Selling new products into the market without background production information is no longer an option. Manufacturers keen to display their green credentials need to demonstrate how their products measure up. At the user end, building designers are researching the provenance of their specified products:

What exactly are the materials involved? Where do they come from? How are they made? If not re-useable, what happens at the point of disposal?.

The move towards environmental accountability is inexorable and inevitable.

The power of you

The potential size of what needs to change appears daunting, but understanding how often significant change is achievable can be a revelation. In just day-to-day practice, the individual architect/building designer/specifier can exercise a meaningful degree of authority. Through control of design and specification, he or she can influence fellow members of the team, the constructor, suppliers, manufacturers and the client. Through leveraging compelling arguments, the building process can be brought together under the umbrella of a common agenda to affect the construction of genuinely sustainable buildings.

The construction industry moves like an oil tanker - it takes forever to change direction. Though necessary legislation is woefully lacking from a negligent government (the bridge), change without top-down direction can still happen - but in small increments (the crew). The aggregate of these small increments will represent a powerful body of building professionals changing construction from within. If you haven't already, try changing your design and specification habits. Learn new things and share it with others you work with (and some you don't). Be a sustainable construction evangelist!. Give it a go - it's never too late to start!



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