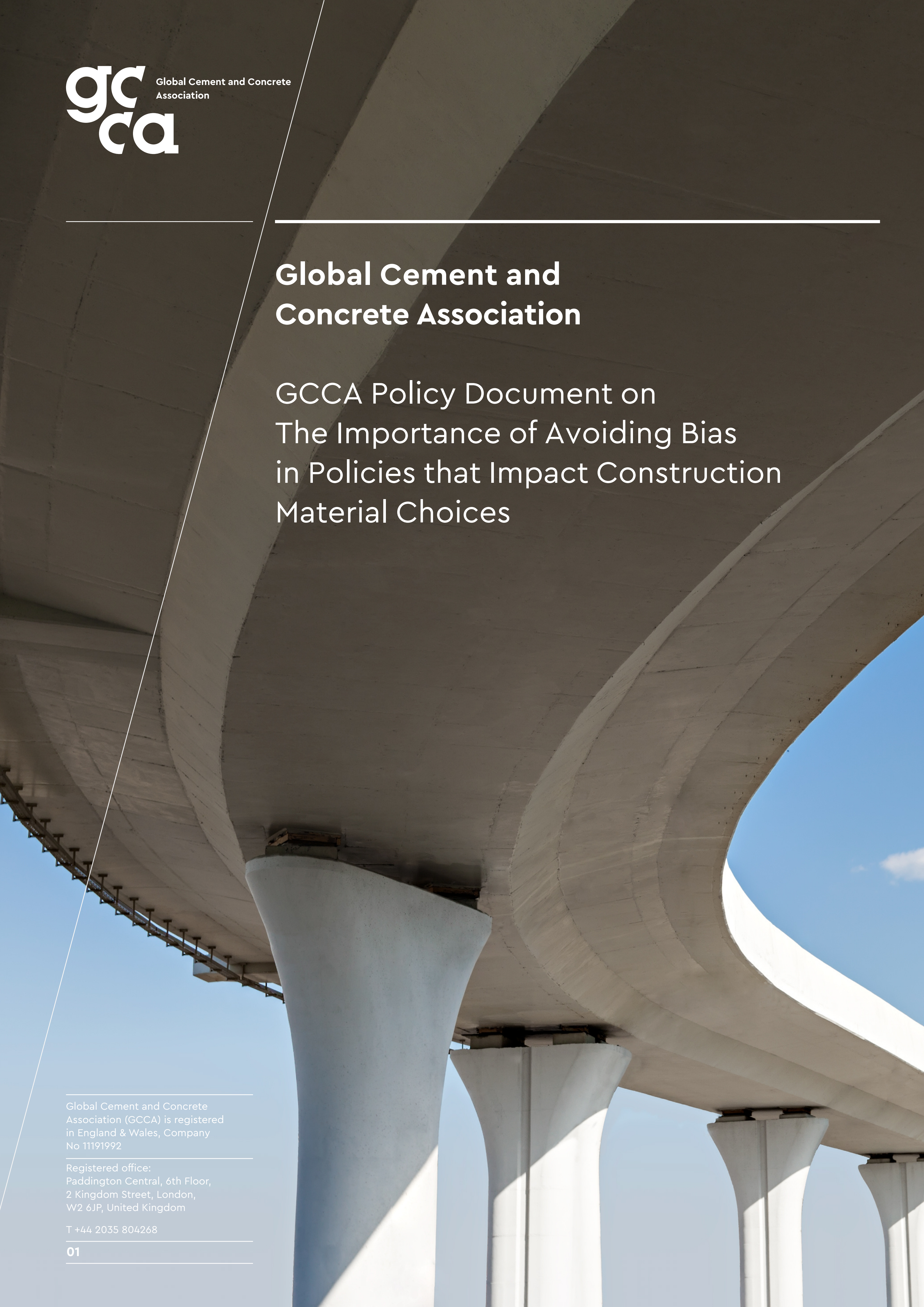

Global Cement and Concrete Association

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GCCA Policy Document on The Importance of Avoiding Bias in Policies that Impact Construction Material Choices

Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

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Position statement

Sustainability must become a key criterion for the design and construction of the built environment of the future and be firmly embedded in policies, codes and regulations. GCCA believe that the most sustainable outcomes can be achieved by policies, codes and regulations that avoid explicit or implicit preference for one construction material over another.

There are many factors that determine which is the most appropriate building material for a given structure, location or purpose. Mandating or promoting one particular building material over others will invariably result in unintended consequences and sub-optimal sustainable performance. To achieve the optimum design and performance, comparison of construction materials should:

1. only be made in the context of, and at the scale of, a whole building or infrastructure asset;
2. consider the full range of economic, technical and sustainability performance issues;
3. assess performance over the whole lifecycle of a building or infrastructure asset;
4. be undertaken by professionals, such as architects, engineers and surveyors, to optimise all aspects of performance and cost;
5. be based on robust data – transparent, relevant, consistent, comparable, complete and accurate.

Introduction

There is an increasing trend of specification and regulation of construction materials, buildings and infrastructure aimed at improving the sustainability of the built environment and, in particular, its carbon equivalent emissions.

Policies and their associated instruments[1] are needed to drive sustainable construction but they must be designed to deliver the desired project and overall sustainable outcomes – environmental, economic and social performance – and avoid simplifications which may have unintended consequences.

The latest versions of lifecycle assessment (LCA) methodologies allow for the quantification of environmental sustainability at the building or infrastructure level.

Schemes for certifying the responsible sourcing of materials take account of social sustainability as well as environmental factors. If commissioned by clients to do so, construction professionals are in the best position to make the material choices for their designs which optimise sustainability performance by balancing the relative material performance merits, conducting whole project lifecycle assessment and assessing responsible sourcing credentials within the context of the structure, location and its purpose.

[1] Policy instruments include regulation, planning, codes, standards and project briefs when policy makers are also project clients.

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Context

Sustainability is a broad and complex issue, as demonstrated by the 17 UN Sustainable Development Goals which have 169 separate targets. The goals and targets include climate change, resilience, employment conditions, material and energy efficiency, well-being, responsible consumption and production, protection and restoration of water eco-systems, safe housing and biodiversity to name just a few. *(Editorial Note: preference is for previous sentence to be replaced by figure showing the 17 UN SDGs).*

All sustainability aspects should be considered when making material and design choices. Focusing on just one aspect may lead to sub-optimal design. It is also the case that individual sustainability issues should not be oversimplified. Take the example of climate change, which results from greenhouse gas emissions, including carbon dioxide.

Carbon dioxide emissions related to buildings and infrastructure occur in all the stages of their lifecycle: manufacture (e.g. sourcing of raw materials, material manufacture, transport); construction (e.g. on-site equipment); operation (e.g. energy consumed for lighting, heating and cooling in the case of buildings or energy consumed to move vehicles in the case of infrastructure); maintenance and end of life (e.g. reuse, recycling, disposal).

Carbon dioxide emissions from the operation of buildings are generally estimated to be in the range 60 – 95 % of whole life emissions, depending on the type and location of the building. However, as carbon dioxide emissions during operation are reduced (e.g. by the fast-growing use of renewable energy), the emissions associated with building materials will, in relative terms, increase. Therefore, efforts to address operational carbon dioxide emissions must continue alongside increased efforts to tackle emissions related to materials i.e. emissions related to their manufacture, maintenance, replacement and recycling/disposal at end of life.

It is critical that approaches to building material sustainability are cognisant of the impact that construction materials have on operational emissions: choosing the right materials and designing them in the optimum way determines the operational energy demand and hence carbon dioxide emissions (with key factors including energy savings and thermal mass).

They should also take account of the resilience and durability of materials as this determines the relative significance of operational and material related carbon dioxide emissions (some materials may last more than 100 years whilst others need to be replaced or maintained on a regular basis).

It is critical then, for both reasons, that whole lifecycle emissions are the target and that operational emissions and emissions related to materials are considered together. It is also critical that whole lifecycle emissions take account of all lifecycle impacts and are based on robust and complete data that covers all carbon dioxide emissions and sinks.

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Principles for the Sustainability Assessment of Building Materials

When assessing sustainability performance in design, the following principles should be observed:

1. Building/Infrastructure Specific
Comparisons of construction materials should only be made in the context of, and at the scale of, a whole building or infrastructure asset, since there are many factors that determine which is the most appropriate building material for a given structure, location or purpose. Direct comparisons, limited to a product or component level, are inherently misleading because of the different contribution they can make to whole life, whole project performance.

2. Comprehensive
The full range of economic, technical and sustainability performance issues must be considered in selecting the most suitable construction material for an application. Selection based on a single issue, may lead to sub-optimal performance in other areas. Key areas for consideration for a typical building are cost, safety, aesthetics, health, time to market, sustainability (including whole life carbon) and resilience.

3. Lifecycle Assessment
Technical and sustainability performance, as well as cost, must be assessed over the whole lifecycle of a building or infrastructure asset. For sustainability, and carbon emissions in particular, this means a careful trade-off between the impacts of each stage, for example, the construction and use stages.

4. Professional
Different building materials have different properties and their technical and sustainability performance as well as cost, depend on their sourcing, application and context of use. Professionals, such as architects and engineers, are best positioned to optimise all aspects of performance and cost. Building policies, codes and regulations must be explicitly and implicitly material neutral to avoid compromising the selection of the best solution for a project.

5. Data Driven
Data used in the assessment of material choice and overall design must be robust – transparent, relevant, consistent, comparable, complete and accurate. Using data sources that do not meet this requirement will inevitably result in misleading conclusions and will not deliver the most sustainable outcomes.

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Recommendations

Policy Makers, whilst **ensuring that safety, health and wellbeing** is a prerequisite performance requirement, should:

1. **Identify required sustainability outcomes from the built environment** while being explicitly and implicitly material neutral. Design and construction professionals are best placed to deliver these outcomes in response to project specifics.
2. **Define sustainability outcomes holistically** recognising the interconnectedness of climate and natural capital and the need to deliver social, economic as well as environmental sustainability.
3. **Target whole project performance,** encompassing both whole life material and whole life operational impacts and their inter-relationship.

Governments, other construction clients and actors in the supply chain should:

1. Use their purchasing power **at the point of product procurement to purchase products with minimum whole life sustainability impact** for their project. This will encourage suppliers to provide product environmental lifecycle assessment data to enable purchase of products with requisite performance and properties, and minimum whole life sustainability impact.
2. **Make use of** internationally recognised project level sustainability assessment methods, such as **LEED, DGNB and BREEAM and systems in development, such as Level(s).** These take account of the complexity of sustainability and have been developed to be used by project teams.
3. **Support development and use of lifecycle assessment tools** that encompass the whole project over its whole lifecycle and promote its integration **into digital design** and project tools.
4. Require construction **products to be responsibly sourced, and local** when possible.
5. Provide **sustained R&D funding** to support and collaborate on large-scale demonstration projects showcasing sustainable construction.

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Our commitments

To support governments, other construction clients and actors in the supply chain, GCCA and its members will:

1. **Continuously improve** the environmental, social and economic **sustainability credentials** of our products and their performance throughout their lifecycle.
2. **provide robust data** for lifecycle assessment and sustainability assessment methods.
3. **Support development of lifecycle assessment (LCA) tools and standards** for use by professionals and in digital design tools.
4. **Provide a certification scheme** for concrete responsible sourcing.
5. Facilitate **R&D collaboration targeting sustainability** of the built environment.
6. **Promote best practices** in sustainable construction.

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